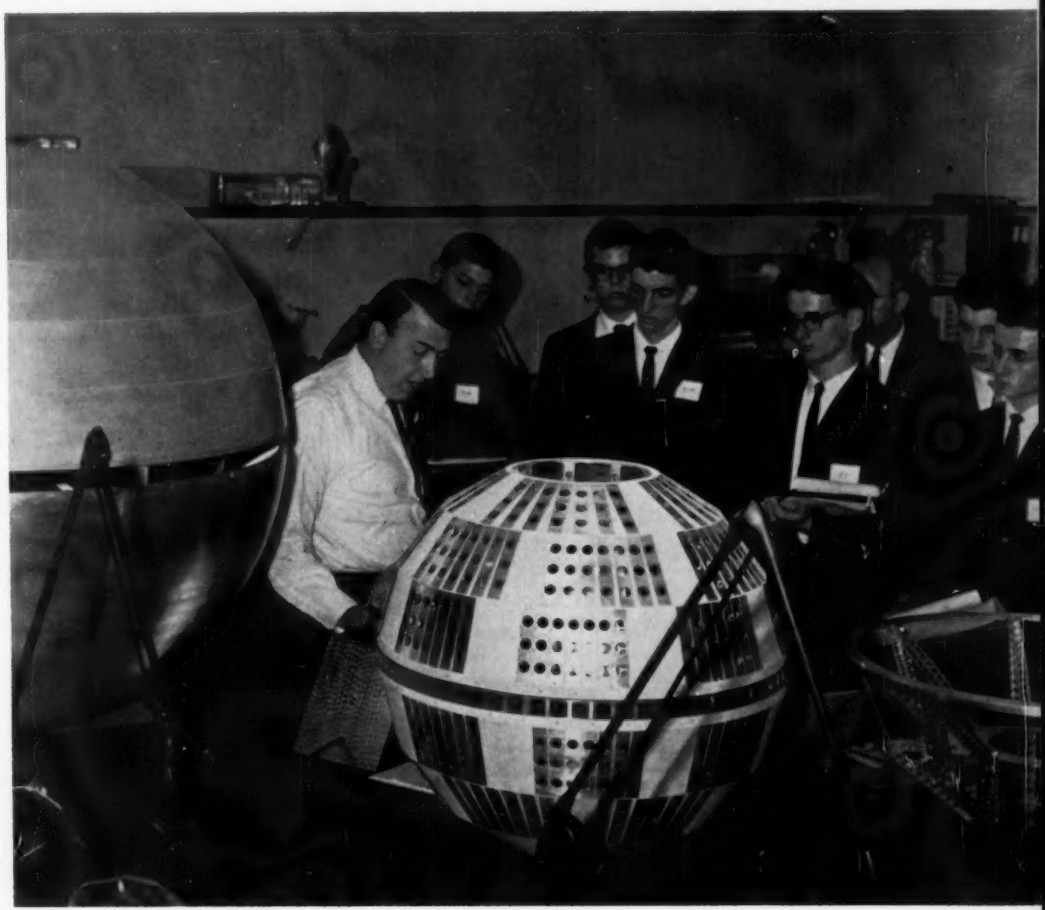
VOL. 161 — NO. 3 JULY 15, 1961

Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY



There is concentrated effort by all branches of industry to acquaint high school students with technological developments. Here are some of the 42 students who attended the first of a series of demonstrations by the Bell Telephone Laboratories. See p. 53.

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FLASHES AND PLUGS

ROBBER OR ROVER. In one small town, the sheriff was also the veterinarian. One night he got a frantic telephone call.

"Do you want me as sheriff or vet?" he asked.

"Both," came the reply. "We can't get our dog's mouth open, and there's a burglar in it."

•

STALKING THE STORK. Possibly, a youthful membership in the Boy Scouts prompted Robert Wintersaler to be well prepared for the arrival of his new baby daughter.

Apparently, the father-to-be had foreseen every possible need or emergency, for when the Wintersalers' 8-pound daughter was born, there were assembled to give assistance:

Twenty-five firemen, one fire chief, two policemen, one ambulance driver, one mother-in-law, one neighbor, one letter carrier, and of course, one worried father.

The Associated Press, which reported the birth of the baby, stated that mother, child and father were all doing fine.

•

WIDGET FIDGETS WITH DIGITS. Aubrey McElroy, age 2, a San Francisco, Cal. tot, proving DDD isn't tricky, at all, recently reached a New York residence by dialing 10 digits.

His mother didn't know about it until she got a bill for $2.25 from the Pacific Telephone & Telegraph Co. The company was amazed at Aubrey's feat, but pleased.

"A chance in a million," an official said. "It goes to prove what a marvelously simple system it is."

The company then decided to forget the bill.

•

BARDOT-ESE, ANYONE? Down Houston, Tex. way, it was reported that college men recently got to talking about the French film actress, Brigitte Bardot.

"Let's call her," one of the college men suggested.

They did eventually reach Miss Bardot via overseas telephone operators, but when she came on the line, none of the students could speak French!

•

BUSSING BANDIT. A Los Angeles holdup man stole $158 from a drive-in theater and added three kisses from the cashier to his loot. He then announced that he was sorry he hadn't met her under different circumstances and asked for her telephone number.

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Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY

1901 — 60 years — 1961

July 15, 1961

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VAC **Circulation Audited and Verified (direct from auditor to subscriber) By Verified Audit Circulation Co.**

Published every week on Saturday by TELEPHONY PUBLISHING CORP., 608 S. Dearborn St., Chicago 5, Ill. Entered as second class matter at the Post Office at Chicago, Ill., under the act of Mar. 3, 1879. 30c per copy (except special issues—50c). Subscription $4.50, 1-year; $7.00, 2-years; $9.00, 3-years. Add $1.00 per year for postage to Canada and Pan American countries; $2.00 per year to Foreign countries. Telephone WAbash 2-2435.

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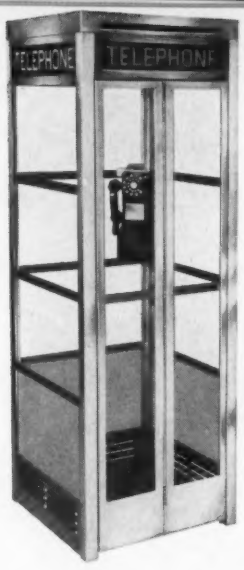

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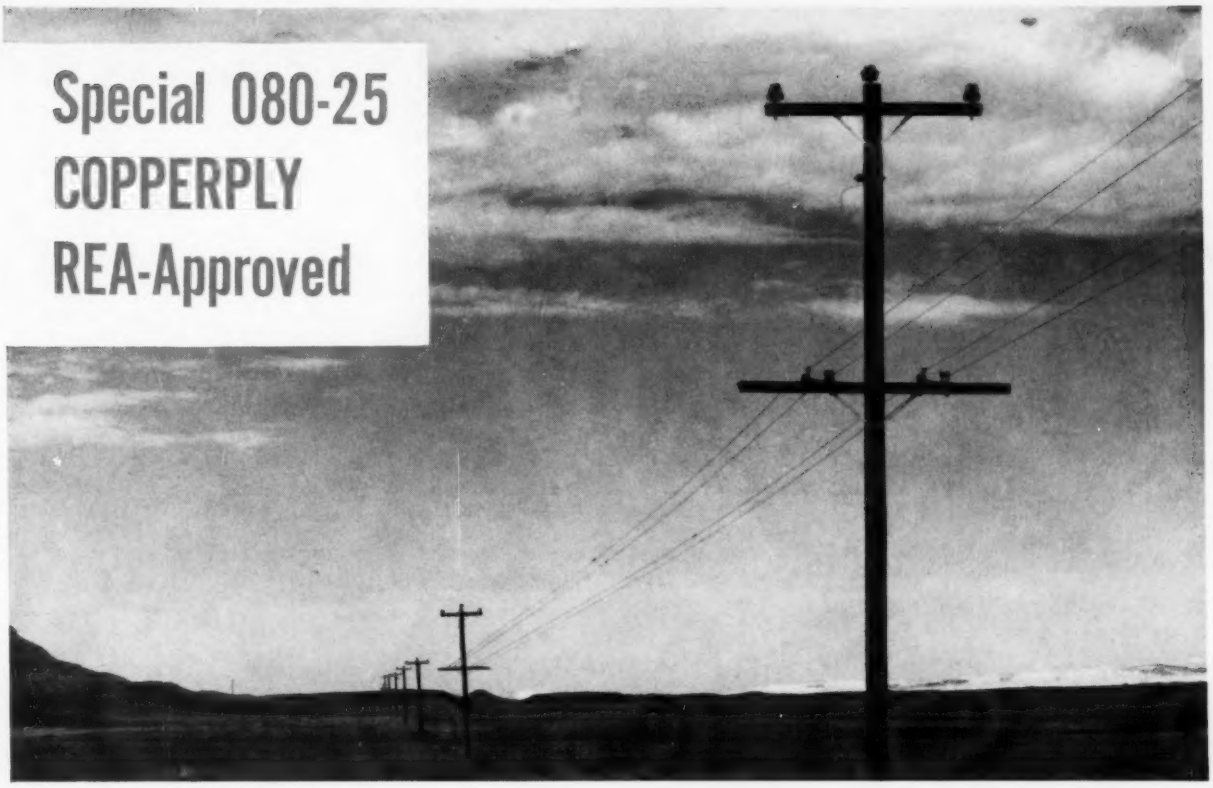
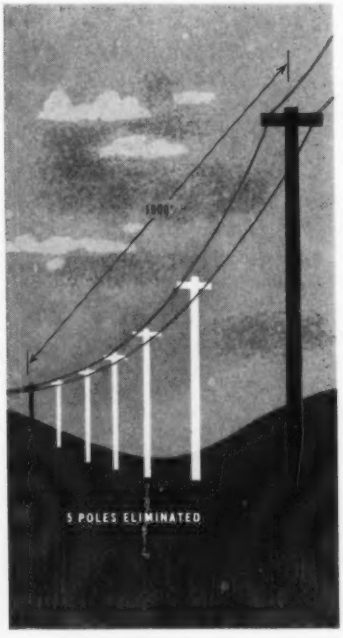


NS SPECIAL 080-25 COPPERPLY® gives greatest economy for joint pole installation



NS SPECIAL 080-25 COPPERPLY also makes possible long-span installation up to 1900 ft. on communications installations, using insulated wire and special construction design.

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less than both?

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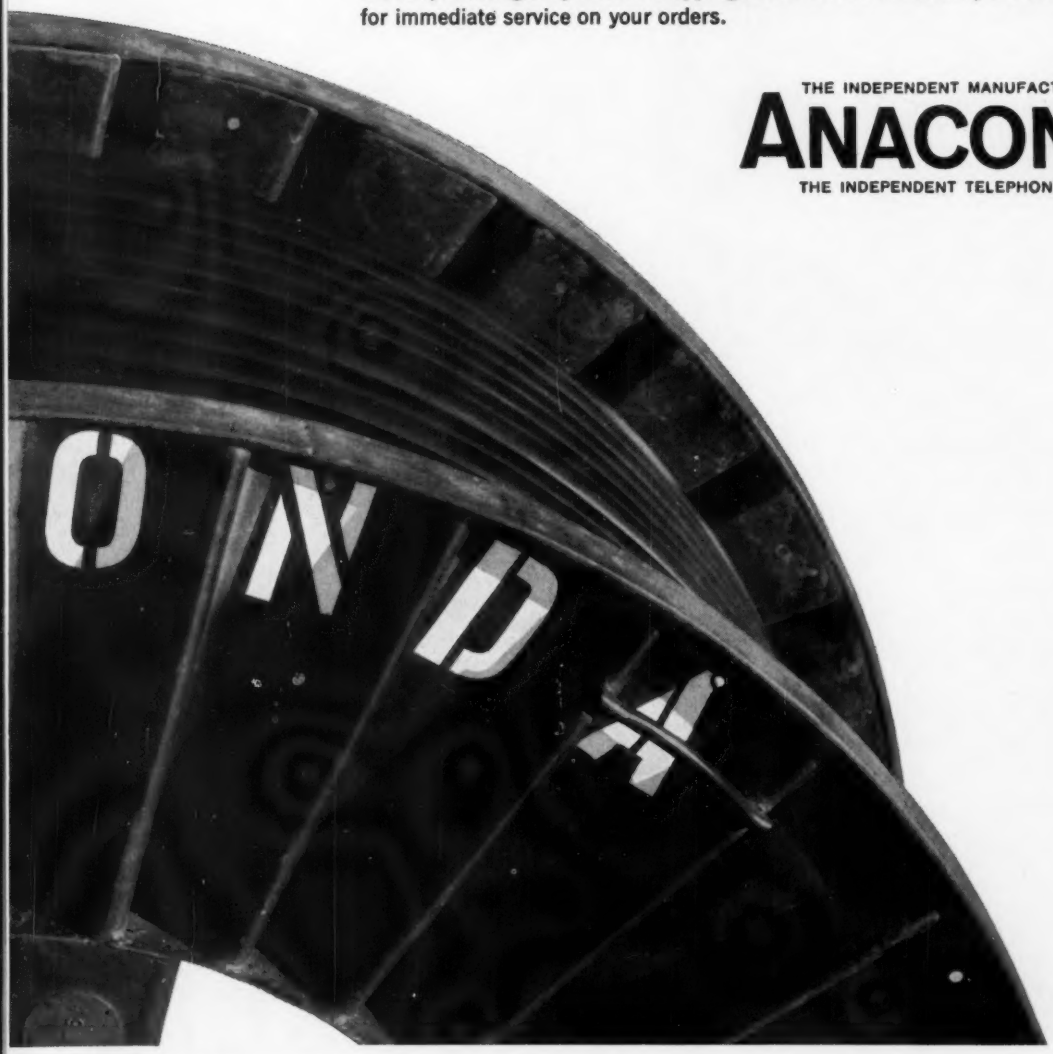

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IN THE NATION'S CAPITAL

BY FRANCIS X. WELCH AND LAWRENCE J. HOGAN
WASHINGTON EDITORS OF TELEPHONY

FCC issues orders on rates for leased-line telegraph service and private line and overseas telephone service, and on Western Electric prices to Bell companies. First six months of Kennedy administration analyzed. Justice Department cracks down on 13 bookies charged with using illegal long distance telephone hookups.

AN INCREASE in leased-line telegraph rates, a reduction in private line telephone rates (in interstate service), an investigation of overseas rates, and a study of Western Electric equipment charges—these four developments were all parts of a bouquet of rate orders handed to the American Telephone & Telegraph Co. on July 6 by the Federal Communications Commission. Let us take them up separately to get the flavor of each a little clearer.

First, the FCC issued an initial decision which would permit AT&T and Western Union to increase rates for leased-line telegraph services. Such services are used by press associations and some newspapers and business firms. The FCC recommended action would authorize AT&T to increase its annual revenues by about 2.7 million dollars for private line telegraph services. Western Union could raise its rates for such services by $750,000.

Second, the commission recommended ordering AT&T to cut its rates on private telephone line services by 1.2 million dollars a year. The recommendations would not become effective until the full commission issued a final ruling, probably some time after Sept. 15. If adopted by the full commission as final, the action would reject a petition from United Press International (UPI), the American Newspaper Publishers Association (ANPA), and the National Association of Broadcasters. They sought a reduction in leased-line telegraph rates to 1958 levels.

The brief FCC announcement said the initial decision rejected a proposal for a special reduced rate classification for the press. AT&T and Western Union had special press rates from 1916 until 1943. The commission announcement did not go into detail. It said a full text of the initial decision would not be available for about a week. Interested parties have until Sept. 15 to comment on the proposals. AT&T and Western Union must file proposed tariff schedules implementing the initial decision by Aug. 15. The FCC has been investigating AT&T and Western Union private line rates since 1956.

United Press International has been opposing an increase for the past 3½ years. The American Newspaper Publishers Association and the National Association of Broadcasters intervened in July, 1958. The press group argued that AT&T had failed to justify the rate increase on leased telegraph wires, which became effective Dec. 2, 1958. They requested that the commission order the rates for all services reduced to 1958 levels or establish special reduced press rates.

"In seeking a lower press rate classification," the United Press International said, "neither ANPA nor UPI is asking for a subsidy by other users or rates which would produce no return to the carriers. No burden upon other customers would result from rates lower than those applicable to customers on the whole, so long as services to the press were not furnished at a loss."

Third and fourth. The FCC took two other actions affecting the rates charged by AT&T. It asked the company to come up with a cost study of its overseas communication services as soon as possible. The study was requested last July. The commission also wrote to Western Electric Co., which is wholly owned by AT&T, suggesting that it was charging too much for equipment it sells to Bell telephone companies. It said Western Electric's earnings on Bell business were 10.2 per cent in 1960 and suggested that "immediate consideration" be given to reducing equipment prices.

Six Months of Kennedy

On July 20, John Fitzgerald Kennedy will have been in the White House for six months. It would be unfair to ascribe to the President all the excited and extravagant predictions of his more zealous advocates. There were those who foresaw a furious period of change, reform, and legislative activity comparable to the "first hundred days" of the New Deal under Franklin Roosevelt in 1933.

So what does the record show, now that six months have passed and the first session of the new Congress is rocking along to a close?

No one would be so flippant as to say of President Kennedy what a nineteenth century satirist once said of an

English political radical, William Godwin (1756-1836):

Where are all the wonderful things
He was going to do,
All complete in a minute or two?

Actually, the President made no such claim to political omnipotence as his followers have voiced. Indeed, fully aware of the narrow squeak of his own electoral victory, Kennedy has moved slowly—too slowly to suit some people. He has felt out the opposition to his foreign and domestic programs in Congress, and he has found it pretty potent—considering both the Republicans and the conservative Democrats. He has trimmed his sails accordingly and sailed close to the wind. If the progress has not been spectacular, there is evidence now and then that it *is* under way, and it *is* moving along.

Confining these observations to domestic matters, there has been no "hectic hundred days" nor anything like it. There have been, however, some pretty hard-boiled developments of interest to the telephone companies and other utilities. Last fall, Kennedy promised his public ownership supporters that he would press for more federal electric power project activity and Rural Electrification Administration activity. He kept his promise.

Then there is that awful "man who came to dinner"—the wartime excise taxes which are still with us for at least another year, including the telephone excise tax of 10 per cent. This "man" came to dinner, figuratively speaking, at the taxpayers' expense way back in 1940 under the excuse of feeding a hungry war effort. He is still around gorging himself and nobody has been able to bounce him out of Washington ever since. Neither Eisenhower nor Kennedy even tried.

Some of Kennedy's domestic proposals in Congress have not stood up—such as his proposed reorganization of the FCC, which the House turned down by a decisive bipartisan vote. He also lost on his Securities and Exchange Commission reorganization proposal. But he made the grade on his plan for the Civil Aeronautics Board (by a close Senate vote of 37-33) and for the Federal Trade Commission. Since all of these programs were very much alike, the only conclusion is that the administration was dancing on a very thin edge of congressional support, and ended up with a stand-off.

Aggressive leadership has been installed at all levels of both the Interior Department and REA calculated to keep spending and lending activity in this area at a high and sustained pitch. The record-breaking 60 million dollar REA loan awarded to Hoosier Co-operative Energy, Inc., indicates that more giant electric generating and transmission loans are in the offing. The recent change in REA telephone loan policy has already been covered in this department.

The Eisenhower "partnership" approach for atomic reactor development seems to be in eclipse, although most pending projects are moving along as scheduled. Yet, most of this activity has been within the *administrative* branch, immediately controlled by President Kennedy. Where desired or proposed changes require *congressional* approval, the administration's progress has not lived up to advance billing despite the wide margin of partisan control in both the House and Senate.

There has been great activity during the past few months to coordinate the various plans to establish a satellite communication network. At the moment, all of the plans still appear to be in a state of flux despite the plea of the communications industry and President Kennedy for prompt action. In this field, at least, it has been declared that the communications industry and the federal government will develop the satellite system and that it will not be dominated by the government.

In reality, the Kennedy administration seems to be lagging in its original momentum. Whether it will break through with major legislative accomplishment is not certain. No spectacular gains are in prospect for this session and, on the domestic front at least, nothing extraordinary looms on the horizon for the next session. Obviously there has been a good bit of difficulty in shifting the reins of government from one set of hands to another, and most Washington observers believe that the complexion of the administration will only now start to emerge.

The new broader social security law is being hailed as a major administration victory and maybe it is. But it was a foregone conclusion, which even the Republicans conceded. The new housing bill was also hailed as a Kennedy victory, and so it was—by a cliff-hanging margin in the House. This, in turn, has been offset by the administration's inability to get the school-aid bill off dead center in the House. All in all, this domestic agenda has been pretty much of a dog-fall, so far.

Bookies Bilk Uncle Sam and Mother Bell

The Department of Justice's crackdown on 13 gamblers who, in alleged collusion with telephone company long lines repairmen, are reported to have bilked both Uncle Sam and telephone companies out of a considerable amount of revenue, should be enough stimulation for other companies to check their own operations for similar swindles.

The 13 men were indicted on charges of using illegal long distance telephone hookups to conceal nationwide horse betting and other gambling operations. A 20-count indictment returned by a Federal Grand Jury in New Orleans also accused the men of conspiring to obtain unauthorized long distance telephone service to defraud the government of taxes and to cheat the American Telephone & Telegraph Co. out of toll charges.

The true bill charged that the defendants, aided by telephone company employes, were able to use long distance telephone calls without authorization and without charge from about Nov. 1, 1952, until July 31, 1959. No toll tickets or other records of the calls were made. Fortunately, it was not mentioned how the scheme was worked, or the amount of the charges which were allegedly evaded, but on the scale that most bookies operate on, this must add up to a staggering loss of income.

Cities from which the illegal calls emanated included Newport, Ky.; New Orleans and Baton Rouge, La.; Biloxi, Miss.; Miami, Fla.; Atlantic City, N.J.; Las Vegas, Nev.; Los Angeles, Cal.; Chicago, and New York City.

The defendants allegedly sought to conceal "willfully, knowingly and corruptly . . . the existence, nature, scope and other details of their widespread horse race betting and other gambling activities."

The operation involved violations of two laws. A conspiracy count against all three defendants said they obstructed the Internal Revenue Service in the ascertainment and collection of "gambling excise taxes and the 10 per cent excise tax on amounts paid for long distance telephone service (and we all know how important *they* are to Uncle Sam). The remaining 19 counts specify individual long distance calls made at various times during the conspiracy. They charge 11 of the defendants with being involved in a "scheme and artifice to defraud the American Telephone & Telegraph Co. and its subsidiaries and affiliates of monies due and payable for long distance telephone calls" in violation of Title 18, Section 1343 of the United States Code, the fraud-by-wire statute.

Maximum penalty they can receive, if convicted, is $1,000 fine and five years imprisonment on each of the counts.

Maybe the arrests will deter similar

(Continued on page 57)

Queen for a Day

By GILBERT R. BRACKETT

THE TITLE "operator" originated back in the days when men in the telegraph business were the first to assemble the switches for telephone lines, and telegraph operators were the first to make the connection between the calling and called party.

Many things have been written about the boy telephone operator, the archetype of our present-day operator. Some of the tales were true, many were born in the vivid imaginations of story writers. There is no doubt that the boys were difficult to control and sometimes caused considerable embarrassment to the telephone company. However, these first operators were but youngsters, from 13 to 18 years of age. Their work called for standing on their feet all day, so it is no wonder that by the end of a 10-hour day they grew irritable and cantankerous.

Ran From Board to Board

The earliest switchboards were a series of vertical boards on which were mounted switches and bells or drops. The operators sometimes ran from board to board to complete connections.

It wasn't the fast service we know today. Often the delay in answering a signal annoyed the calling party and he would yell into his transmitter, "What's wrong with yuh, kid, been sleeping," or perhaps, "Take that chaw of terbacca out of your mouth so's I can understand what you're trying to say!" Often the caller would add a few superlatives that about melted the insulation off the wires.

Eventually, after hearing such demands all day, the young man would become vehement in his answer. In fact, the lurid repartee often became so loud and violent in some exchanges, the young men operators were fired faster than they could be hired. Many times the young switchboard attendant would sidle out the back door in order to avoid conflict with some irate customer who awaited him at the front entrance.

Had Other Duties

When a diversion attracted the attention of an operator he would forget all about the calls on his board and when he did answer them he would return the impatient customer's profanity with a blast of hair-raising thunder of his own.

In addition to ascertaining which of the closely-mounted similar-sounding bells were ringing on his board and making the connection requested, the boy operator often had a multitude of other duties to attend. He swept out the office, kept coal and wood on the fires, carried out the ashes, ran errands, sometimes collected bills, and occasionally he was used as a troubleman to clear short-circuited and crossed line wires which were so prevalent in the open-wire leads of that day. Generally, he knocked the trouble clear by tossing a buggy-wheel spoke into the lead. If he didn't have one of these, a tree branch, a rock or any other such missile would suffice.

The boy operators generally needed sympathy rather than criticism. "What would you have done, Boss," they would tearfully demand when called upon the carpet, "if some smart Aleck called you a dirty name?" Sometimes the answer was, "Run around the block, kid, and come back when you've cooled off." More often it was, "That's no excuse for your doing the same to a customer. Get out!"

Decide to Hire Girls

Service was practically ruined in some exchanges, as conditions grew worse. Finally, it dawned upon the management that boy operators were not the answer, and that there was only one remedy for the critical situation—girl operators!

When the telephone industry decided to add a feminine touch to the art of operating, it was quickly discovered that parents did not consider the job as telephone operator an uplifting one for their daughters. After all, their

experience with telephone operators had been most unpleasant in many cases, and in many ways. Besides, in those days, most mothers, as well as their daughters, were of the opinion that the working girl had little chance of becoming married.

Office managers visited homes and endeavored to sell the girl and her parents on the importance and dignity of the operating job. Their success was hardly noticeable. A few girls applied for work as temporary employes and learned that telephone operating was an interesting change from factory work, clerking, dressmaking, etc. They spread the news among their friends, telling them that conditions were more pleasant and the work less fatiguing than factory jobs. They found out also there was a much greater future in the telephone business than in any of the jobs open to young women in those days. Friends recommended friends and eventually there became a waiting list of girls who wanted to become operators.

Education Not a Factor

Little thought was given to educational qualifications, inasmuch as few girls continued their education through high school unless they had a teacher's job in mind. There were no employment offices or departments. There was no uniformity or formality in applying for a job. Some companies would not take a girl unless her father was dead and she had to support herself and family. Others put a ban on hiring married women, widows (grass or sod), sisters or women from out of town.

There was no training of any kind given to new operators. They learned by sitting at the board and watching the more experienced girls operate—a slow, unsatisfactory method of teaching because the girl learned the bad habits of the old operator as well as her good points. Often, after only a few hours of watching, the new operator was given a position of her own to handle during slack periods. Sometimes a girl who had presented an application for an operating job, but hadn't been accepted, would stop at the office of an evening or on a Saturday or Sunday afternoon and have a friend who was working teach her the rudiments of operating, at no pay.

No Standard Phrases

There were no standard phrases in the early days. The operator said what came to her mind. It could have been "Hello" when answering a signal or, "Yes, what is it?" No attempt was made to acknowledge a call and few subscribers received a "Thank you" after a request for a number. Good service depended mostly upon the moods of the operators.

First telephone operators were 13 to 18-year-old boys, who stood on their feet all day and who were difficult to handle when traffic was heavy. Their undiplomatic handling of subscribers often caused embarrassment to the telephone company.

Many of these pioneer operators were barely in their teens, few of them had ever used or seen a telephone. Even so, the company and the customers conceded that the service the girls gave was far superior to that given by their predecessors—the boy operators. Most girls had parental approval to work only day hours, so boys still held down the evening and night shifts. For several years after girl operators were introduced, boys continued to be employed as operators.

Sunday Work a Problem

Sunday work was another problem. Ministers and laymen frowned upon girls working on Sundays. Most young ladies, away back in the 1880's were serious churchgoers. Fellow members of the congregation became loud in their criticism of the unorthodox conduct of girls who worked Sundays as telephone operators. It took a long time to sell the general public that telephone service had to be maintained on Sundays as well as any other day because of emergencies that would require the help of the telephone to solve. In many towns, service was given on Sunday only on an emergency basis.

It soon became apparent that girls were particularly adapted to telephone work. The pampered school girl of upper grade or high school age soon discovered the telephone industry was a profession that called for her ingenuity, courtesy and patience. Best of all, the telephone users saw the light and

Operating room of the La Crosse (Wis.) Telephone Co. in the early 1900's. (Reproduced from the July, 1901 issue of TELEPHONY.)

began behaving with the proper decorum. They became courteous, patient and agreeable.

"Secretarial" Service Given

The demands upon an operator's time went far beyond the operating of the switchboard. She gave weather reports, fire locations, time of day and other information. She called Mr. Pearson early enough in the morning for him to make his train. She rang Mr. Kline to tell him his wife had just called and wanted him to bring home a slab of bacon for supper. The operator gave Mrs. Carlson a buzz at a certain time so she could remove a cake from the oven at the right moment. Often Mrs. Boyd left her baby close to the telephone with the receiver off the hook, so the operator could reach the mother next door should the baby awaken and cry before the mother returned home.

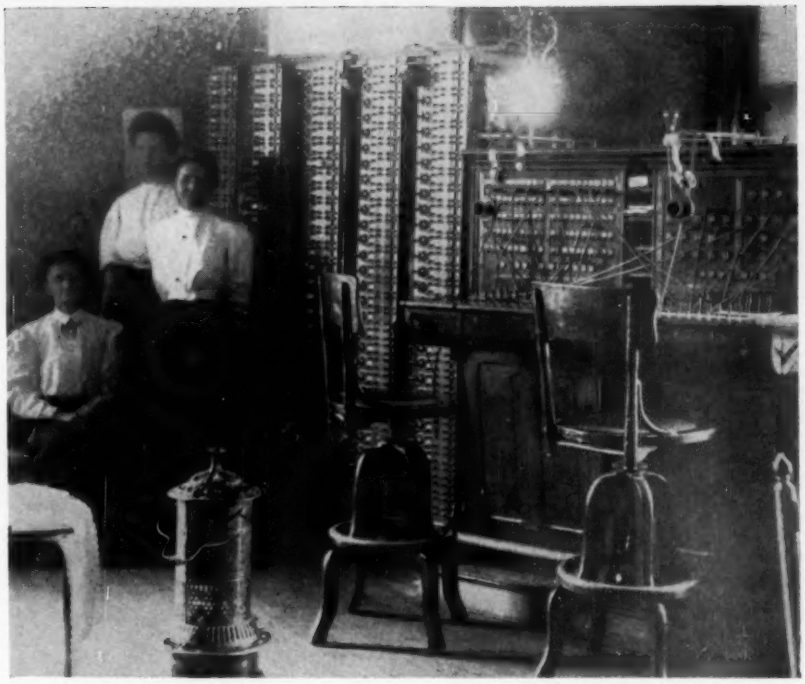
Such little overtones of service were often rewarded with boxes of candy, a cake or a pie and occasionally with a cash bonus at Christmas from thankful subscribers.

Sold Toll Tickets

As the telephone business expanded and more and more exchanges came into use, the need for toll lines became apparent. But toll lines cost money, a commodity the telephone companies had little of. To take care of some of the cost of toll line construction, a telephone company would sell toll tickets in advance of construction, good for their face value over the lines when constructed. A selling plan would be instigated and all employes would take part in the selling campaign. Many advance toll tickets were sold. The sale not only helped finance building the toll lead, it promoted the habit of using the circuits. People who bought the tickets spent them freely.

In some small exchanges in rural areas there had been no notable change in the way they were operated until they were converted to dial. In some places, a switchboard was set up in the back of a general store, in a home, or in a recess in some business establishment where the operator continued to give the personalized service so common to the early days.

As the telephone's popularity increased and traffic became an avalanche of calls never thought possible, the necessity for operating rules became apparent. The operators were expected to learn these rules by heart. The first operator training school was established in 1902. Other such schools soon followed. In some of the larger cities various training courses were given and practice switchboards were installed. Along with such innovations, management became interested in working conditions for the operators. At first, free lunches, fruit, hot tea, coffee or cocoa was provided. In the early 1900's lunchrooms appeared, followed in quick order by cafeterias.



Typical of early central office equipment was this "viaduct" switchboard, installed by the old Highland Telephone Co. of Delta, Pa., about 50 years ago.

Restrooms and dressing rooms were set aside for operators. A New England company supplied these quarters with baths and permitted the operators a half-hour relief every Saturday evening for their weekly ablutions. Matrons and, in some cases, trained nurses were employed to supervise the operator's comfort. The moral health of the operators was guarded by some companies. Profanity and drinking intoxicating liquor was prohibited. Cigarette smoking was strictly forbidden. It didn't seem to enter management's mind that girls could dim their sweetness by such base habits, so the ladies were never mentioned in the edicts.

Sanitation a Problem

Even when it was discovered that an operator's health, mental attitude and comfort made a great difference in the kind of service she gave, little thought was given to the sanitation problems that arose. In many of the offices, even in some of the larger offices, vermin was very much in evidence. Many offices became infested with roaches, waterbugs, bedbugs, etc. I can recall an instance that happened in the late twenties. While visiting a large central office, my attention was directed toward a parade of roaches emerging from the multiple jacks of the B-board. Bedbugs infested rest rooms. Such vermin was taken as a matter of course. There was a powder on the market that was supposed to eradicate such pests, but the insects seemed to grow fat on it. There were no professional exterminators.

In another office, fleas got into the multiple and were seen by the operators. To placate the girls, the switchboard-men referred to them as cable lice. They told the operators that most offices had them, that the cable in the switchboard attracted the insects and no method for exterminating them had been discovered. Of course, in due time the pests were eliminated, but in the interim the operators continued to talk about the cable lice that had taken over their switchboard.

Matrons Took Over

Some matrons who were employed to care for the operators' quarters were motherly old ladies who took upon themselves the job of ruling with a firm hand. They watched over the operators as a shepherd watches over his sheep. They taught them to sew and mend. They helped them with their personal problems. They listened to their troubles and sympathetically tried to assist them over rough spots.

Sometimes the girls took advantage of the company's goodheartedness and generosity. A chief operator informed

(Continued on page 60)

Annual Review

New Developments in Telephony

By RAY BLAIN, Technical Editorial Director

THE RAPID growth of the Independent telephone industry to meet its public's demands for expanded and improved communication services, and to meet, head on, increased outside competition, has created serious challenges to Independent operating companies. However, Independent companies, as a whole, are meeting the challenge by adopting new equipment and techniques and expanding their present facilities.

Independent telephone equipment manufacturers and other producers have been responsive to Independent operating companies' needs and requirements in designing and fabricating equipment, materials and tools which make the rendition of expanded and improved telephone communications possible.

In a recent survey of Independent companies, most of them expressed a high degree of interest in articles on new products and techniques and requested that TELEPHONY continue to currently review them in its columns.

In response to this request, we, again, are presenting our annual review of the latest developments and we hope it will be beneficial to all telephone companies in both their expansion and modernization programs and in the everyday maintenance and operation of their plants.

PART 1

Information Processing System. ***(Fig. 1).*** Burroughs Corp. has developed a new solid state electronic data processing system, which, the company claims, overcomes shortcomings of many previous computers.

It departs from traditional concepts of computer design to drastically cut programming time and problem-solving costs long associated with conventional computer systems, according to Burroughs.

Fig. 1. Information processing system.

The B5000 is an ultra-high speed data processing system that automatically "adjusts to its own environment," schedules and keeps track of its own work load, and actually tells itself as well as its human operator how it's doing. But even more important, the system strikes at the heart of operational problems that have troubled computer users for the past 15 years, regarding full, economical use of these valuable electronic tools, the company states.

In spite of their sometimes spectacular progress, computers have encountered some special problems of their own creation, resulting in unanticipated costs. Chief among these problems have been the difficulties of man-machine communication and the inefficient use of high-speed electronic system capabilities.

The B5000, it is claimed, will drastically reduce programming costs because the system is the first one specifically designed to accept programs written in algebra (for scientific and engineering problems) or in English language statements (for business data processing).

This machine doesn't just bridge the communications gap, it eliminates the gap itself by removing the problem.

The built-in ability to process programs written in the Common Business Oriented Language (COBOL) and Algorithmic Language (ALGOL) will be standard with this computer system.

•

Transistorized Microwave Carrier. ***(Fig. 2).*** A completely transistorized microwave carrier system has been introduced by the Texas Division of Collins Radio Co.

Designated the MX-106, the system, according to Collins, provides maximum reliability and efficiency for multi-channel communication, yet requires only one-fifth the rack space and consumes only one-eighth the power of similar tube equipment. It handles 600 voice

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Start with cost. Instead of three or more units, AChieverfone has only two units: the control head and the R-T unit. This means AChieverfone costs less than other systems.

Next, take design. AChieverfone is as modern and attractive as today's newest home telephones making MTS more appealing to your subscribers.

Finally, consider installation time. AChieverfone can be installed in just two hours. Only eight screws are required to mount the two units. The interconnecting cabling is plugged into these two units, thus eliminating tedious wiring in the vehicle.

These facts make AChieverfone the best common carrier MTS system you can buy. For more information write or call AC today.

SPECIFICATIONS—FCC Type Accepted

Transmitter: 144-174 Mc, 4-Channel
RF output: 22.5 watts into 52 ohm load

Receiver: 144-174 Mc, 4-Channel
Wide Band (60kc) or Narrow Band (30kc) models available (Bands quickly converted to Narrow or Wide by substituting IF filter)

Frequency Stability: within 0.0005%

Selective Signaling: 51,000 five-digit (compatible, 2-tone sequential) codes available

Size: Receiver-Transmitter, 21⅛" x 8⅜" x 6¼"

Weight: 37.25 pounds, including receiver-transmitter, control head and cable

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channels whose quality meets or exceeds toll circuit requirements. An initial low channel density system can be expanded at any time.

The MX-106 uses the frequency division principle with single sideband, suppressed carrier techniques. Frequency allocations, sideband allotment, and

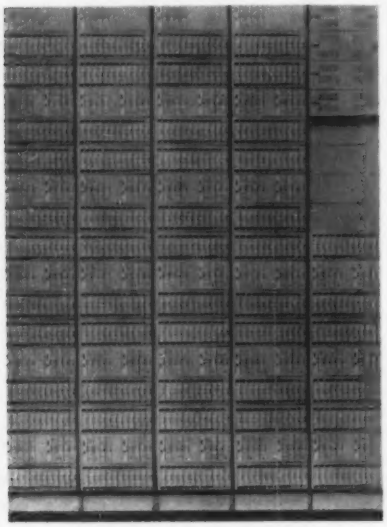

Fig. 2. Transistorized microwave system.

carrier levels are compatible with Collins MX-103 Carrier, Western Electric L-Type Carrier, CCITT and others. To achieve maximum channel density, multiple modulation techniques are used to form a composite baseband signal for transmission by broadband transmitting equipment.

All active MX-106 components affecting the signal path are semiconductors, which operate well below their maximum ratings for long service. Printed wiring circuits and a minimum of transistor types assure ease of maintenance. For sideband and frequency selection, the system uses Collins Mechanical Filters. These have essentially flat bandpass characteristics with excellent skirt selectivity.

All MX-106 circuits are printed on card modems that plug into special rack-mounted card cages, 12 modems to the cage. Card size is approximately 1¾ by 6 by 9 inches, and the card cage occupies 7 inches of rack space in a standard 19-inch relay rack. For 24 channel modems and base group modulators, rack space required is only 21 inches.

Standby features of the system include 100 per cent backup of any equipment common to 12 or more channels. Sensing of standby equipment is provided. Pilot tones provide a reference for synchronization, level regulation, sensing and alarm.

Transistorized Microwave Package. ***(Fig. 3).*** Motorola has developed a transistorized microwave package which includes new RF, multiplex, telegraph carrier and alarm equipment.

Transistorization of all stages except the RF transmitter klystron, it is claimed, marks a revolutionary step in the field of microwave. The equipment operates in the 6,000 mc region.

Motorola has labelled its new transistorized line the 50 Series. RF equipment is designated MR-50; the multiplex is MC-50; telegraph carrier is MT-50; and the alarm system is MA-50.

All four equipments in the new package incorporate modular construction and etched circuit cards for ease in servicing. Pull out drawers enable "in service" maintenance from the front of the racks.

The equipments can be operated from either ac or dc power sources. Solid state components are utilized for high reliability. Reliability is attained also through the use of transistorized circuitry. Long life transistors increase reliability over similar circuits employing vacuum tubes and make practical new circuit techniques.

The only tube in the entire package is a long life reflex klystron tube in the transmitter of the MR-50 RF equipment. Providing a minimum one-watt klystron output, this tube has a life expectancy of 20,000 hours of continuous operation.

The MR-50 equipment utilizes a transmitter AFC which provides a frequency stability of ± .005 per cent to conform to proposed FCC standards. This stability is achieved by use of a newly designed klystron AFC control grid referenced to a crystal controlled oscillator source.

This equipment is available in nonstandby, standby, frequency diversity and space diversity models. The standby model provides such features as hot switchover and bilateral switchover. Separate receiver and transmitter packaging enables independent switching.

As many as 600 subcarrier channels of toll quality voice communications are provided through Motorola's MC-50 SSB multiplex equipment. Frequency division multiplexing is utilized which meets all CCITT recommendations and Electronic Industry Association requirements.

The 600 channels occupy a bandwidth extending from 60 to 2,540 kilocycles, providing 4 kc channel spacing. Twelve basic subcarrier frequencies are combined with a series of group and supergroup frequencies to generate the 600 individual carriers.

Zero frequency drift between channels is accomplished through the use of a pilot signal that is transmitted throughout the microwave system to cause all channel, group and supergroup carrier oscillators to lock in frequency.

Design of the new multiplexing equipment takes into consideration users whose early communications needs require 12 or less channels. No supergroup chassis is needed in systems with 12 channels or less.

Single sideband suppressed carrier operation permits a wide list of signaling and termination options. There are 13 standard signaling options which can be obtained by changing plug-in etched circuit cards. This includes solid state E & M signaling.

The fully transistorized MT-50 telegraph carrier equipment provides 18 frequency-shift tone channels over a

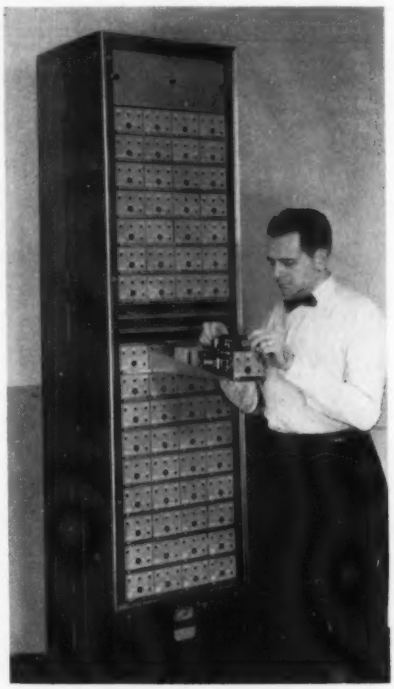

Fig. 3. Transistorized microwave package.

single voice circuit and 22 channels which are applied directly on the baseband of a radio communications carrier. Channels may be used for service in teleprinter, telemetering, load control and other control and data carrying applications.

Each channel can be operated at signaling rates corresponding to teleprinter speeds of 100 words per minute or of transmitting variable frequency telemetering signals up to 35 cps. Three-position keying channels are available for load control functions, and

(Continued on page 28)

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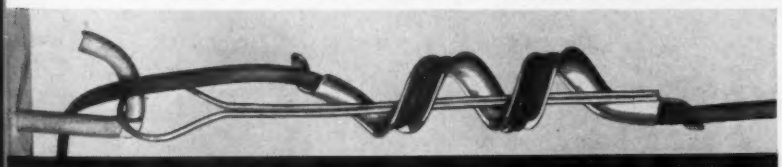
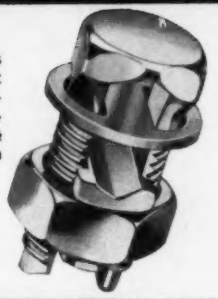
SPAN BRACKETS provide one or more service connections from knobs or hooks at points between poles. They fasten to the messenger and may be used on lashed or ring supported cables.



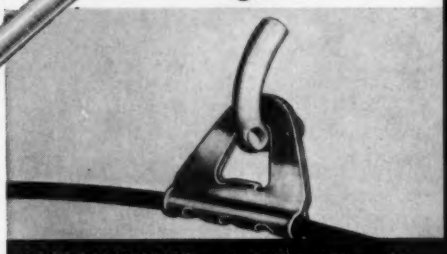
SNUB-R-GRIP DROP WIRE GRIP provides an efficient, free-swinging tie for drop wire attachments to poles and buildings. Snubbing action is greater than rated strength of the conductor because of spiral grip.

CON-NEC-TITE Solderless Connectors, for bridge or test connections. Assure low-resistance. Precision made for repeated use. Bodies are bronze or brass or plated for use with iron wire.

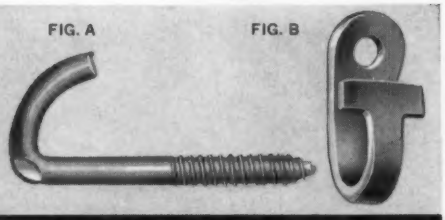


CLAMP-TITE GROUND CLAMP... will not loosen under vibration, expansion, contraction. One-piece copper construction has spring action for constant clamping force.

FULL-VUE GUY GUARDS in either All-Round or Half-Round style. High-strength aluminum alloy is easily visible at night. Weight is one third that of steel but is equal in strength making for easy installation. Guard clamps, will not turn on the strand.

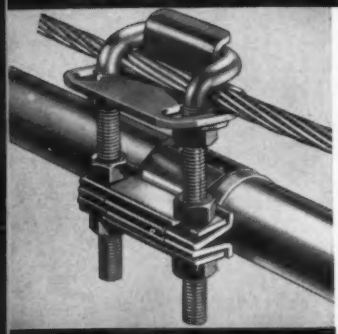


DROP WIRE CLIPS... stainless steel... for use with either parallel or twisted pair drop wire for intermediate fastenings on straight line drop extensions... are designed to grip tightly without damaging.



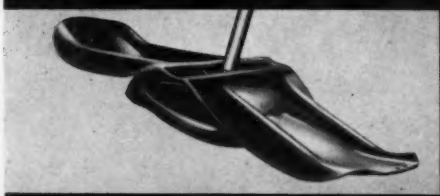
HOUSE AND POLE HOOKS: Fig. A is a standard house hook, ideal for hollow tile walls and similar construction. "B" is a drive hook which has wide application and is made in large and small sizes for pole and house use respectively.

RUST-CUTTER loosens ferrous and other corroded hardware in seconds... atomized mist reaches otherwise inaccessible rust.



GRADE CLAMPS maintain proper spacing between cable and messenger, regardless of size of the cable ring used. Stainless steel band binds cable to clamp preventing injury to the sheath and permits complete reconditioning by inserting a new band.

AIRSEAL... seals out moisture, corrosion, oxidation... will not deteriorate underground... is not affected by temperature. Dielectric strength exceeds 280 volts per mil. Easily applied; just mold it with the hands ... it bonds itself. It's easily removed and does not stick to hands or gloves.



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GENERAL SYSTEM
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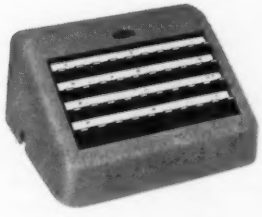
Motel-Hotel Services

These new Leich service features are tailor-made for your motel-hotel customers. Tell your business customers about them—and see how they sell!

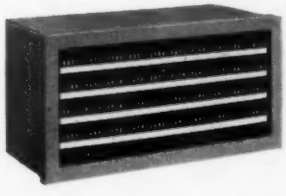
- **MESSAGE WAITING SERVICE** signals a returning guest that the PABX attendant has a message for him. By operating a key on the message waiting turret, the attendant starts a lamp flashing on the guest's telephone. When the guest returns, he sees the light flashing and knows there's a message for him.
- **TWO OR THREE DIGIT DIALING BETWEEN ROOMS** (May be restricted by PABX attendant in late evening hours.)
- **ONE DIGIT DIALING** to PABX attendant, hotel garage, room service, maid service, to trunks, when permitted, etc.
- **ANY STATION MAY CALL OUTSIDE TO MAIN EXCHANGE** without waiting for attendant. Charges on local calls are automatically tabulated on message register cabinet. (Toll calls may be restricted if desired.)
- **ROTARY LINE SERVICE** permits listing only one number for a group of telephones. For example, if you dial "5" for maid service and the line is busy, you are automatically routed to an idle telephone in this department.

Boost your profits with Leich PABX's. Write today for complete information.

KEYSET TURRET EXTENDS INCOMING CALLS QUICKLY.



MESSAGE WAITING TURRET



MESSAGE REGISTER CABINET COUNTS THE NUMBER OF CITY CALLS PLACED BY EACH GUEST.

LEICH SALES CORPORATION • 427 WEST RANDOLPH STREET • CHICAGO 6, ILLINOIS

PACIFIC COAST: 11401 W. PICO BLVD., LOS ANGELES 64, CAL. EAST: 3651 CONNECTICUT AVENUE, YOUNGSTOWN, OHIO

SOUTHWEST: 1227 SLOCUM STREET, DALLAS 7, TEXAS SOUTHEAST: 5126 SOUTH LOIS ST., TAMPA 11, FLORIDA • 2915 W. MOORE ST., RICHMOND, VA.

manufacturers of telephones, switchboards and related apparatus since 1907

for transmission of three position pulses at rates up to 20 pulses per second.

MT-50 can be operated from the companion MR-50 or MC-50 power sources or from its own power source.

With the MA-50 equipment, microwave users can monitor 22 remote stations for faults with eight points scanned at each station. Through use of solid state switching circuits, continuous scanning is accomplished.

The system can monitor any device whose status can be reflected by an open or closed external contact. Such functions are commercial power failures, switchover to standby RF units, tower light failure, illegal entry.

To prevent loading the baseband, transmission takes place only when a fault is reported to the master station.

Available with the MA-50 system is a remote desk-type alarm indicator for monitoring a system from an office or any location physically separate from the receiving equipment.

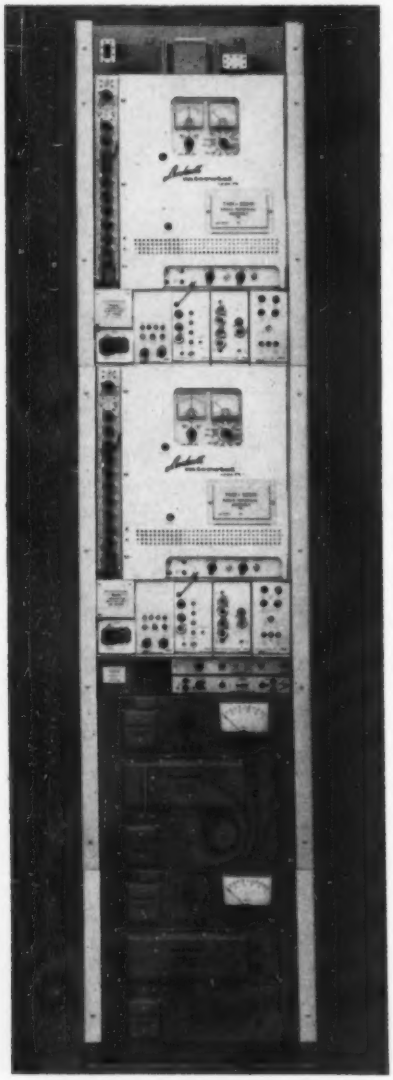


Fig. 4. Microwave equipment.

•

Microwave Equipment. ***(Fig. 4).*** A new microwave system—Type 74B—by Lenkurt Electric Co. provides broad band radio transmission facilities in one or three frequency ranges: (1) mc common carrier, (2) 6575-6875 mc industrial, and (3) 7125-7750 mc government. This equipment has been FCC type-accepted for 2.1 mc bandwidth. A basic transmitter-receiver assembly accepts 300 voice channels or more—depending on application — from appropriate telephone carrier equipment. Provision has been made for the simultaneous operation of up to four transmitters and receivers over a single antenna to meet high traffic-density demands. Antenna systems may include either elevated parabolic antennas or antenna and passive reflector combinations. A Lenkurt Microtel system (up to three operating r-f channels with one standby on a common antenna) can accommodate 900 voice channels.

This equipment operates from standard 24 or 48-volt office battery supplies or from 115-volt ac mains. The power consumption is approximately 300 watts per r-f channel terminal from either office battery or ac mains.

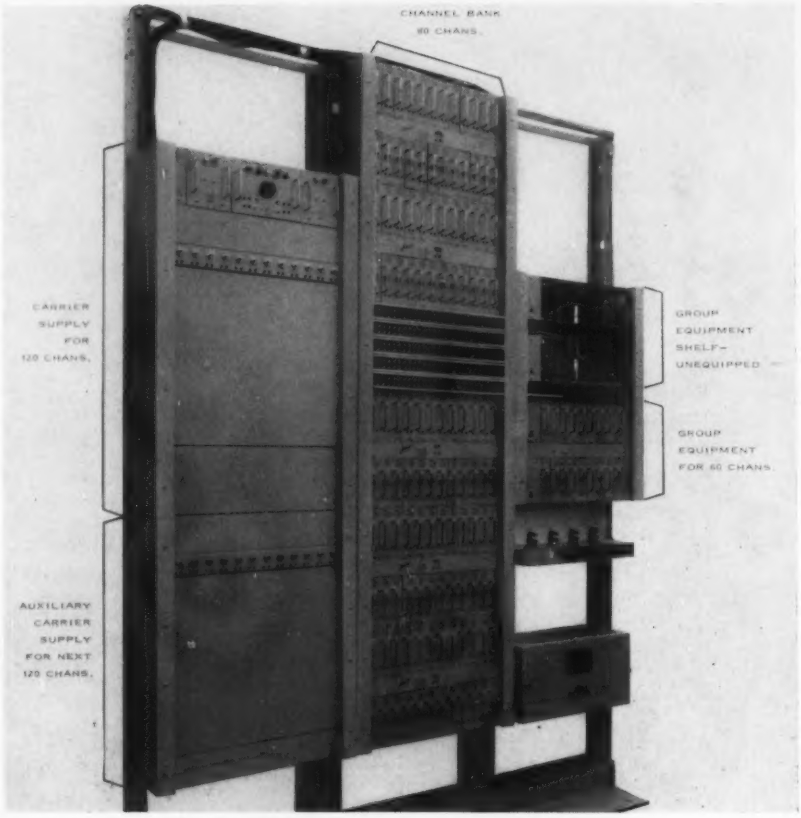

CHANNEL BANK
60 CHANS.
CARRIER SUPPLY FOR 120 CHANS.
GROUP EQUIPMENT SHELF— UNEQUIPPED
GROUP EQUIPMENT FOR 60 CHANS.
AUXILIARY CARRIER SUPPLY FOR NEXT 120 CHANS.

Fig. 5. Telephone carrier system.

The equipment is easily installed on standard 19-inch racks by using compact plug-in construction and the back-to-back space saving arrangement. Most units are plug-in and all components are accessible from the front; three built-in meters with switches to monitor all functions necessary for normal maintenance; built-in test points.

The power supplies are all regulated and insensitive to frequency variation. Reference cavity and heat sinks eliminate the need for ovens and blowers.

A single terminal can accommodate 300 single sideband suppressed carrier channels; with r-f circulator, the second, third or fourth terminals can be added to the same antenna, without service interruption. The back-to-back baseband connection at repeaters permits dropping and reinserting channel groups, giving maximum system flexibility. No additional baseband amplification is required.

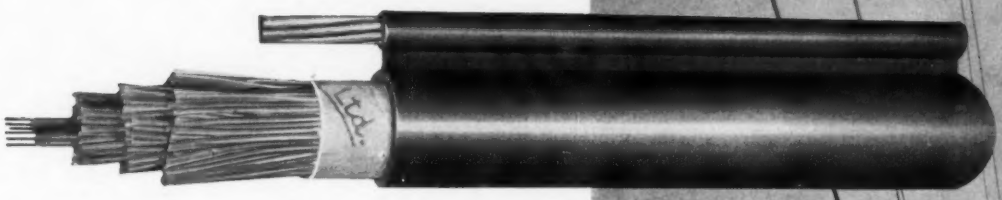
•

Telephone Carrier System. ***(Fig. 5).*** Lenkurt also has a new transistorized carrier system capable of providing up to 600 voice channels on long-haul radio transmission systems. This system is designed to coordinate with Western

(Continued on page 61)

HITACHI

This is the Gourd-type cable — a new shape that contains a suspension strand, a communication line, and the answer to several problems!



This unique local or exchange area cable developed by Hitachi derives its distinctive "gourd shape" from the polyvinyl chloride sheathing that totally encloses the polyethylene-insulated communication line as well as its parallel suspension strand. It can be used in all the applications of conventional PE-insulated PVC sheathed cable and, in addition, is suitable for installation on steep grades where paper-insulated lead sheathed cable could not be used.

Another notable feature of the gourd-shaped cable is that it dispenses with the need for hangers, making installation easier, cheaper and faster. It can be installed close to buildings and power lines with complete safety (the suspension strand can be grounded to reduce electrostatic induction in the latter instance), retains high transmission qualities under the most trying weather conditions, and successfully withstands attack by salt or airborne chemicals.

Communication Equipments

Hitachi, Ltd.
Tokyo Japan

Cable Address: "HITACHY" TOKYO

New Transistorized Carrier Multiplex

System from General Electric

THE TCS-600 MEETS BOTH YOUR PRESENT AND FUTURE REQUIREMENTS WITH TRUE "BUILDING BLOCK" DESIGN

- Up to 600 full duplex voice channel capacity
- 120 channels in a standard 8-foot high rack
- Takes 1/3 to 1/10 the space of comparable tubed equipment
- Input power dramatically less than tubed equipment
- Superior channel frequency characteristics
- Static signaling used throughout; no relays
- Greater reliability — low temperature operation, many MIL spec components
- Lower maintenance—components operate well within ratings
- Less outage — parallel components in the common equipment and transmission path
- Lower cost — no tube replacement, less power consumption, far less servicing

The TCS-600 is a single sideband suppressed carrier system for cable and radio. Because of its outstanding characteristics and low cost it was recently selected for use by Western Union, Florida Telephone Corporation, Southern Railway and New York Telephone Company.

The design philosophy of the TCS-600 together with its complete transistorization has resulted in major advancements in carrier communications. It is capable of short, medium and long hauls, as well as low, medium and high channel capacity. All known requirements for a system have been met and allowance has been made for important future requirements.

Idle channel noise does not exceed 15 dba and the loaded noise is less than 23 dba. Individual channel frequency response is ± 1 db. All domestic and CCITT standards are met or exceeded.

The advantages listed above tell only part of the TCS-600 story of improved performance, reliability and reduced cost. For complete details, write General Electric Company, Communication Products Department, Section 3571, Mountain View Road, Lynchburg, Virginia.

TCS-600 POWER AND SPACE REQUIREMENTS

POWER — 48 VDC Input			POWER 120 VAC Input			SPACE					
	Without Signaling	With Signaling		Without Signaling	With Signaling	Channels	Rack Size	Without Signaling # Racks	Without Signaling Floor Space	With Signaling # Racks	With Signaling Floor Space
12 Channels	225 Watts	240 Watts	12 Channels	200 Watts	225 Watts	120	8 Ft.	2	4.84 Sq. Ft.	3	7.26 Sq. Ft.
60 Channels	310 Watts	385 Watts	60 Channels	225 Watts	425 Watts	240	8 Ft.	3	7.26 Sq. Ft.	5	12.10 Sq. Ft.
240 Channels	560 Watts	930 Watts	240 Channels	550 Watts	1375 Watts	600	8 Ft.	6	14.52 Sq. Ft.	11	26.62 Sq. Ft.
600 Channels	945 Watts	2915 Watts	600 Channels	1300 Watts	3400 Watts						

Progress Is Our Most Important Product

GENERAL ELECTRIC

How Rochester Tel Simplifies Number Change on Subscriber Sets

RECENTLY, the Rochester (N. Y.) Telephone Corp., converted telephone service in its Webster, N. Y., central office to dial operation. This village, a suburb approximately 10 miles east of Rochester, has about 5,800 subscribers.

About 2,000 of the Webster subscribers had been served from Rochester on a dial foreign exchange basis. Since each of these customers already was served by a dial telephone, and since it would not be necessary for servicemen to visit them to equip the telephone with a dial, the company sought an inexpensive method to apply a number sticker bearing the new dial number to these 2,000 telephones.

Prior to the Webster conversion, Rochester Telephone used a dial instruction pamphlet. However, this booklet contained only the central office prefix and not the subscriber's complete number.

"Our first consideration was to revise the pamphlet to carry each subscriber's individual number," company officials said. "This, we found, would result in considerable expense, and would present the possibility of error since each dial sticker would have to be stamped individually and then matched with the respective customer for mailing.

"At this point we decided to contact Avery Label Co. for advice. We told the label specialist of the type of card we desired, the kind of subscriber information it should contain and the fact that it had to be compatible for processing on an IBM type 407 accounting machine."

The solution was the development of a pressure-sensitive Tabulabel which completely tells the subscriber all basic information:

(1) New number.
(2) Contact the business office for additional dial discs.
(3) Complete instructions on how to apply the new dial discs.
(4) Name and address of subscriber.
(5) Two new dial discs to be applied to subscriber's telephone.

These labels were then printed with this information and supplied to Rochester Telephone for use with its existing equipment. Upon receipt of the labels, the accounting department processed them in a matter of hours from punched cards already maintained.

This error-free method eliminated all tedious collating and other costly arrangements previously considered. All that remained was the final step of inserting them into envelopes and mailing.

Another advantage was the elimination of the need to address envelopes, since the label is inserted in a window envelope with a form letter advising the subscriber on the date to change his telephone number.

"We would say that the use of the dial number label simplified the job of administering number change mailings with considerable reduction in costs and time," note Rochester Telephone Co. spokesmen.

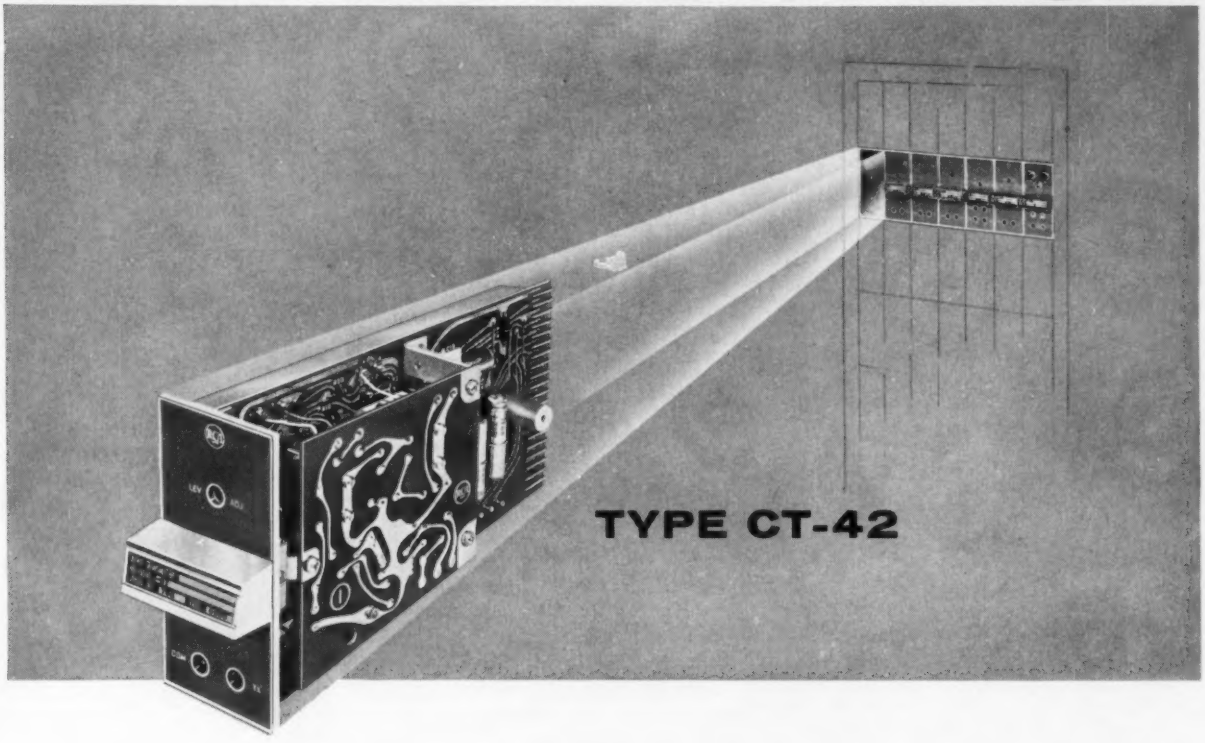
For the subscriber, the task of changing his telephone number is simple, and requires no mechanical tools or other trouble. He merely peels off the disc with his number imprinted and affixes it to the celluloid cover over the number card already on his instrument.

This task is accomplished easily because the disc is coated with pressure-sensitive adhesive, which adheres on contact without moistening.

Use of data processing equipment and dial labels has opened a bright new approach to the overwhelming problem of how to convert subscribers' telephone numbers as Rochester Telephone converts to Direct Distance Dialing, since the DDD area code is also imprinted on the disc labels.

Subscriber merely has to peel off pressure-sensitive dial disc with his new number imprinted and affix to celluloid cover on his telephone.

NEW... FROM RCA



SOLID STATE TONE MULTIPLEX

FOR WIRELINE, MICROWAVE OR CARRIER

24 channels from 420 to 3180 cps—Spaced every 120 cycles (CCITT Standards)
18 channels from 4300 to 7600 cps—Spaced 170 to 220 cycles

The CT-42 is an all new tone multiplex of high performance designed to operate over a wide environmental range. Ruggedly built, it uses computer grade components for lasting dependability.

Each channel can be frequency-shift or AM keyed for teletype, telemetering, control or data signals. Six transmitters or receivers in any combination may be plugged into a standard shelf which also contains a husky regulated power supply.

Channel units operate from 24 V DC or 117 V AC power supply.

If you are looking for the newest and best in tone multiplex equipment, mail the convenient coupon for complete specifications and prices.

RCA
The Most Trusted Name in Electronics
RADIO CORPORATION OF AMERICA

RADIO CORPORATION OF AMERICA
Microwave Equipment, Dept. XC-189
Building 15-5, Camden 2, N.J.

☐ Please send new catalog sheet and price list on Type CT-42 Tone Equipment.

NAME_____ TITLE_____

COMPANY_____

ADDRESS_____

CITY_____ ZONE_____ STATE_____

world's most beautiful, lightweight

It's a fact of the industry! Subscriber demand for the Cinderella phone is unprecedented . . . so is the demand among alert independent telephone companies! That's because this great new telephone *returns more revenue per investment dollar* than any other!

And it's a fact of the industry, too: when you're introducing a new subscriber unit, it's wise to rely on the company that gives you the unit with *all* the features and performance your subscribers will expect; plus, the type of service and promotional assistance *you* expect. You're wise to rely on ITT Kellogg . . . for the product, and the promotion.

Contact your ITT Kellogg Representative or ITT Kellogg direct.

ITT **KELLOGG**

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telephone . . . the Cinderella

The Plant Man's NOTEBOOK

By RAY BLAIN, Technical Editorial Director

IT IS REPORTED that fewer college freshmen are taking engineering. For the last three years, the actual number of engineering freshmen fell from 78,750 (1957) to 70,050 (1958) to 67,700 (1959) to 67,550 (1960). Since the last drop was only 150, a reversal in the trend is hoped for.

The Engineering Manpower Commission, however, draws attention to the relative aspects of these data. Among the freshman class as a whole, the proportional standing of engineers tells a dramatically different story. The proportion of engineering candidates to all freshmen dropped from 10.8 per cent (1957) to 7.3 per cent (1960).

What does this mean in terms of future graduates? Unless the pattern of transfers and retention rates change —and there is little reason to believe that it will—the supply of engineering graduates will be at, or below, the present level of 37,500 for the next four to six years.

•

The writer flew recently from Washington, D. C., to San Antonio, and then drove with W. E. Billington, engineer for the Signal Office Third Army, to Killeen, Tex. The occasion was the cutover to in-dialing of the Army Telephone System at Fort Hood. This new service was established without difficulty and is certain to prove extremely popular.

While in Killeen, we also enjoyed a visit with W. T. Reichel, general manager, and his gang from the Mid-Texas Telephone Co. Killeen has a beautiful new exchange in a fine new air-conditioned building, and business is booming.

•

We have recently noticed an increase in the number of complaints against contractors during excavating operations. It is reported that often when contractors are furnished drawings indicating accurate locations of cable, they cut them, just the same. It is suspected, in some cases at least, that it proves less expensive to cut cables with a trenching machine than to suffer the delay and expense of digging them out by hand. This is especially true when a contractor carries insurance that covers the cost of repairs to underground cable.

However, interruption of service proves both expensive and a detriment to the public relations of any telephone company. Perhaps, the best and only safe plan is for the telephone company to keep a representative on the job continually when a contractor is operating a trencher in the vicinity of any underground communication cables.

If any of our readers have a plan to avoid this type of trouble, we would appreciate hearing about it.

•

Arlington National Cemetery, near Washington, D. C., is without doubt one of the most beautiful spots in the world. It was even more beautiful on Memorial Day, when 600 men from the Third Infantry decorated approximately 109,000 graves. A small American flag and a poppy placed near each headstone provided a blanket of color reminiscent of the famed poppy fields of France.

•

During 1960, Southern Bell Telephone & Telegraph Co. had an average of 10,971 trucks and automobiles. These vehicles traveled a total of 125,312,170 miles during 1960 alone, an average of 11,422 miles for each. According to the latest census, the population of the United States averaged more than 50 people per square mile.

If this company's vehicles were seen by only 5 people for each mile traveled, then each vehicle was seen a minimum of 57,110 times during the year. This means that each vehicle had 57,110 chances to influence public opinion by its appearance, by the safety with which it was driven, and by the driver's courtesy on the road.

People everywhere notice all telephone vehicles. They notice them wherever they go. It is from what they see, that they form their image of the company and the people it employs.

•

The National Science Foundation in Washington, D. C., reports that almost 70,000 scientists and engineers, representing 44 per cent of the total at United States colleges and universities, were working in research and development during 1958. This is the latest year for which figures are available.

The survey also indicated that the 377 reporting colleges and universities, increased their money allocation for research and development from 410 million dollars in 1954 to 738 million dollars in 1958.

•

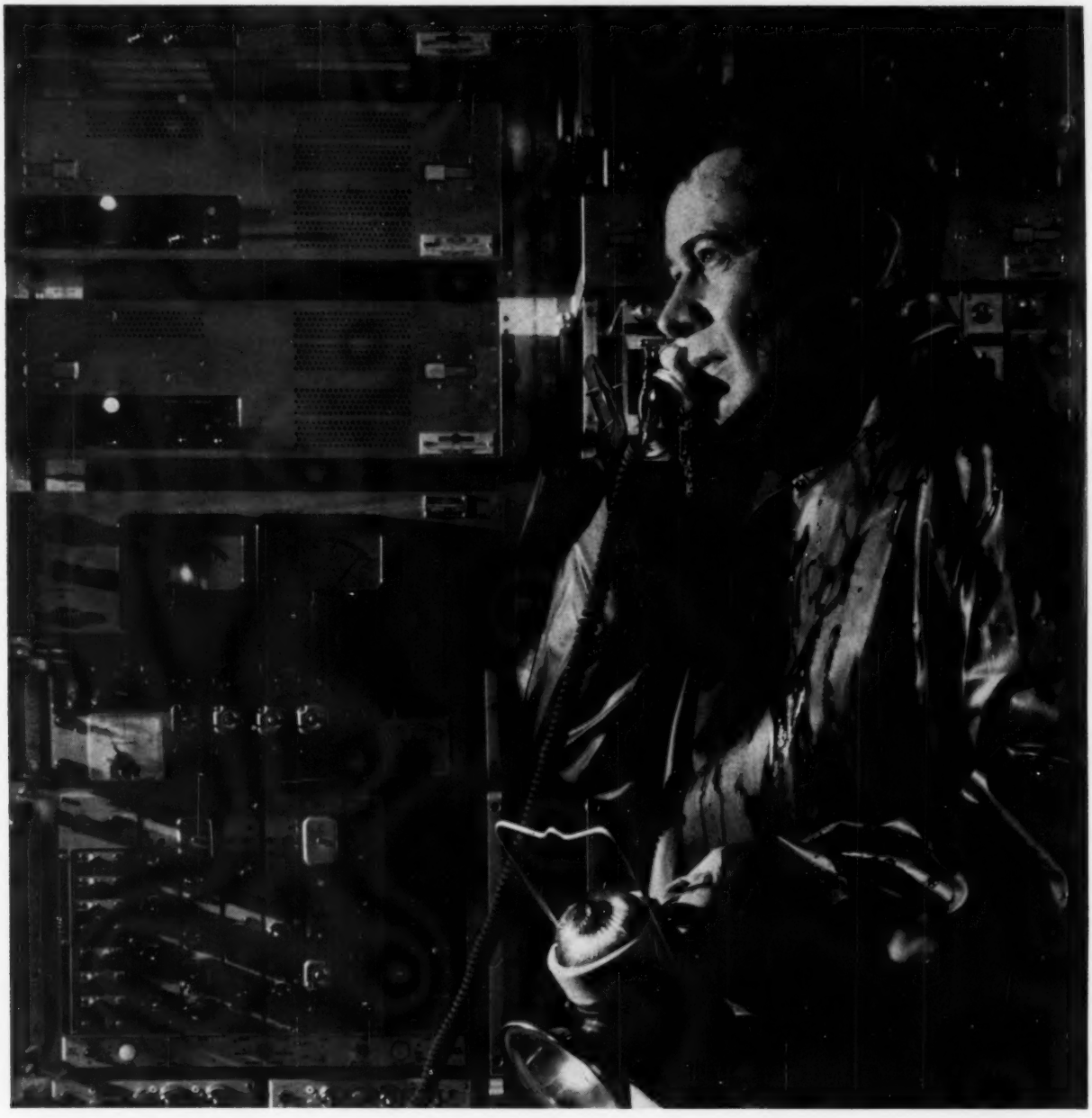
The new office building recently occupied by the state of California in downtown Los Angeles is being served by the first Centrex system installed by the Pacific Telephone & Telegraph Co. This new #5 crossbar system that switches all private branch exchange (PBX) extensions may be located in a central office, rather than on a customer's premises.

In addition, these features of Centrex appealed to the state officials:

(1) Centrex provides the equivalent of individual telephone service, since direct inward dialing is available.

(2) Outgoing calls can be dialed direct without going through a switchboard.

(3) Station identification is available so that individual station billing or accounting may be accomplished. This



New Collins DC system insures uninterrupted communication...when you need it most!

Now... security against even momentary outages during power-disrupting storms. Collins' dc-powered Microwave and Carrier Systems operate directly from float-charged batteries — eliminating rotating machinery. The results: improved reliability, reduced power drain, lower maintenance, decreased noise and elimination of standby generators. Several voltage combinations are available, enabling you to select the one that best integrates with your existing plant. For technical literature, write Collins Radio Company, Texas Division Sales, 1930 Hi-Line Drive, Dallas 7, Texas.

COLLINS MICROWAVE AND CARRIER

COLLINS

COLLINS RADIO COMPANY • DALLAS, TEXAS • CEDAR RAPIDS, IOWA • BURBANK, CALIFORNIA

aids the state accounting and allows for direct budgetary billing, replacing the former state practice of pro-rating certain telephone service charges to individual agencies.

(4) Centrex means eliminating mechanical equipment located on the customer's premises.

(5) It requires fewer attendants, thus releasing employes to fill other important state jobs.

Initially, the proposal for the State of California allowed only for the call-transfer feature of Centrex. This means that the transfer of a call could be effected only through a PBX attendant who would be notified of a transfer request by a special code dialed by the called party. It was stipulated, however, that when a fully mechanized transfer feature is engineered, tested and built into the #5 crossbar, which is the heart of the Centrex system, it will immediately be made available to the state.

•

A new book that all communications engineers will value is titled: "Vacuum Tube Characteristics," and is edited by A. Schure. This soft cover book of 96 pages can be purchased from TELEPHONY for $1.80.

Billions of vacuum tubes are now in use and billions more will be placed in use in the future. The author has succeeded in presenting an extremely comprehensive discussion on vacuum tube constants and characteristics without wasting any words. Electrons and electron emission are discussed from both the general and physical viewpoint.

Diode characteristics and ratings are explained, together with the various formulas involved. The diode is explained in connection with its characteristic curve, amplification factor, plate resistance and trans-conductance.

Other sections of the book cover the use of the load line in the analysis of triode circuits, characteristics of multigrid tubes, and special purpose tubes.

Written at the intermediate level, the book succeeds in making the fundamentals of vacuum tube constants completely understandable and useful. Review questions appear at the end of each chapter.

•

We enjoyed a visit in Washington, D. C., recently with Roy Surgi, of the S&G Mfg. Corp.

Roy gave us information on the latest developments in equipment now available for cable pressurization. It is certainly gratifying to learn that so much cable is going under pressure in the Independent industry. Actually, however, operating telephone companies cannot afford to do without cable pressurization.

Plant Man's QUIZ

By RAY BLAIN, Technical Editorial Director

Q. What is a solderless wrap connection, and how is it made?

A. The solderless wrap is a method of connecting a wire to a terminal without the use of solder. It consists of wire wrapped around a terminal to meet the requirements of a permanent electrical and mechanical connection under adverse conditions.

A solderless wrapped connection is accomplished by using special tools designed for ease and simplicity. The connection is made by inserting a skinned wire into the wrapping bit. The wire is then anchored. The tool bit is then placed over the terminal and the tool trigger squeezed. The rotating wrapping bit winds the wire around the terminal to produce a permanent solderless connection.

Over the years, the conventional solder connection has proved to be reliable. This reliability has, however, been attained at a cost. Solder connections are bulky. They may not be uniform throughout the equipment, and they are comparatively slow to produce.

Solderless wrapped connections, on the other hand, require little space, achieve uniform connections, are faster and safer to make, and eliminate undesirable solder characteristics such as splashes, heat and clippings. Thus, with the new progress in tooling and design, connections as strong and free from electrical resistance as the best solder connection have given reliability to solderless wrapped connections.

Coupled with the accepted "time-space-labor" advantages, reliability equal to solder connection has made solderless wrap both feasible and practical in the operating telephone field.

•

Q. Can you recommend a suitable book for a beginner on the study of atomic energy?

A. A soft cover book of 76 pages by William G. Atkinson titled: "Introduction to Atomic Energy" should meet your requirements. This book may be purchased from TELEPHONY for $1.35.

This is a good primer for all who have a desire to learn the fundamentals of atomic energy without probing the depths of engineering texts on the subject. This book starts with a discussion of the atom, its components, and the necessary physics and chemistry required to understand the nuclear force; the fundamentals of radioactivity; the various particles and other components of nuclear radiation.

Then, nuclear reactions, with special emphasis placed on the fission reaction, are discussed. A number of different types of reactors, as well as the materials that enter into nuclear reactors, are lucidly explained. A later chapter explores reactor design problems. The last chapter provides a specification listing of all existing reactors.

•

Q. Can you tell us how drop wire can be protected when it must be installed through trees?

A. Clear plastic tubing is now available to provide protection for drop wire. This material is extremely rugged, resistant to abrasion and treated with a violet ray inhibitor to withstand severe weather conditions. This tubing is available in 3/16-inch, ¼-inch and ⅜-inch inside diameter.

Plastic guards that are wound into a close helix and can be easily spiraled on existing drop wire are also available.

•

Q. Can you recommend a satisfactory method of insulating the handles of pliers?

A. We suggest that you consider the use of Klein-Koat grips. These grips are made of transparent plastic in a bright maroon color. They will not slip or creep once in place. To install, simply dip the plastic grips into boiling water to within one inch of the closed end for 45 seconds. Then, drive on the plier handles. The grips' flexibility permits them to conform to the shape of the handles to assure a neat, tight fit. These provide a comfortable, non-skid grip, but are not intended to be a substitute for rubber gloves.

LOW-COST, LONG-LIFE PROTECTION

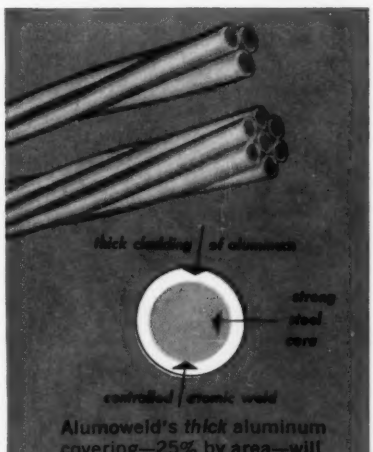
for your overhead lines

Alumoweld Guy and Messenger Strand is designed to last as long as the pole it guys or the cable it supports. Each wire of this low-cost strand has a *thick* aluminum covering applied to the strong steel core by the controlled atomic-welding process. This unique method of manufacture gives Alumoweld the same permanent protection against corrosion as solid aluminum wire.

The rugged strength of Alumoweld is the same as steel, yet Alumoweld weighs 18% less and lasts far longer. It's easy to handle, easy to install.

Supplies of Alumoweld Strand are available for prompt shipment from our warehouses in New York, Chicago, Pittsburgh and Memphis.

For the complete story on Alumoweld, write for Engineering Bulletin E.D. 3000.



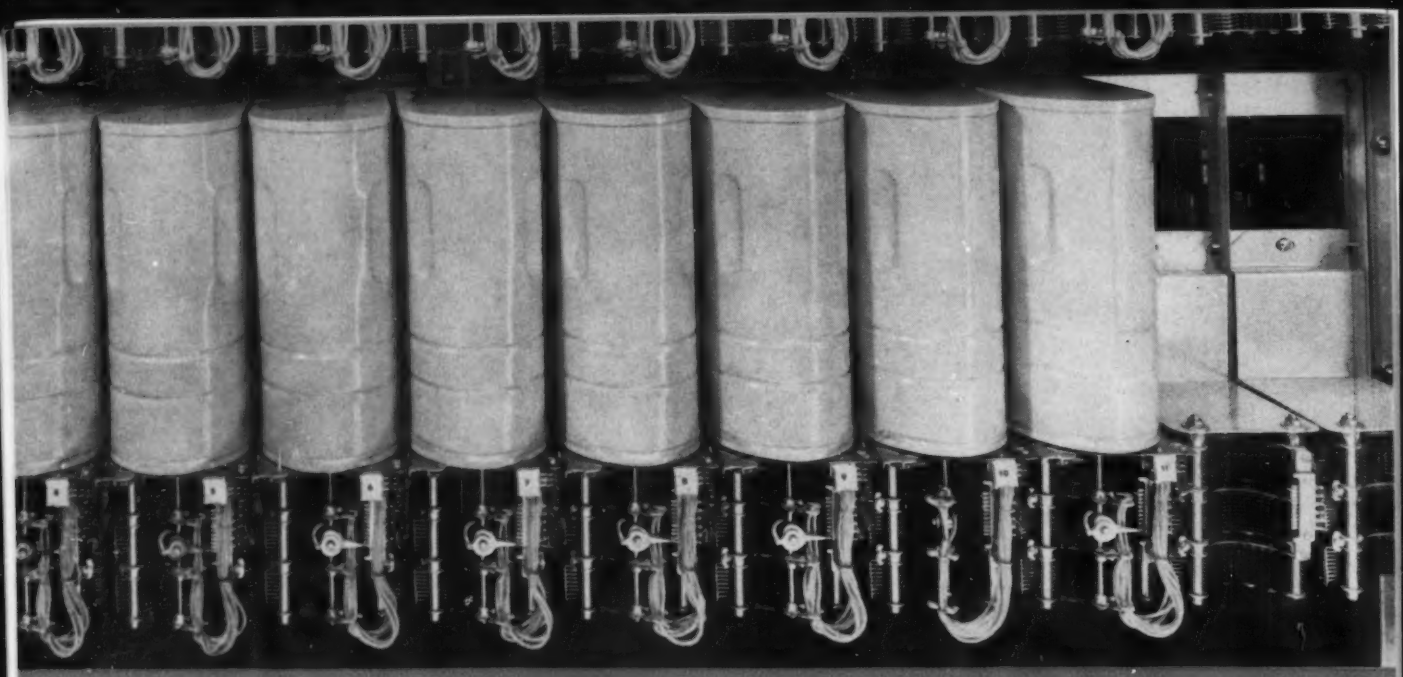
Alumoweld's *thick* aluminum covering—25% by area—will not crack, flake or peel. It is inseparably interlocked with the high-strength steel core by a ductile weld that remains permanent under all operating conditions.

COPPERWELD STEEL COMPANY

WIRE AND CABLE DIVISION Glassport, Pa.

For Export: COPPERWELD STEEL INTERNATIONAL COMPANY, New York

Canadian Distributor: NORTHERN ELECTRIC COMPANY LIMITED



Strowger

"That's right, Tom...

is easier to maintain"

Maintenance is an important factor to the buyer of dial switching equipment. That's why Arnold Pearson* always stresses the simple construction of Strowger Automatic. He explains that Strowger operates on a step-by-step principle which keeps repairs and adjustments to a minimum. But that's only part of the story...

Arnold points out that all Strowger switching components are positioned so that the circuit operation can be traced visually. He also mentions the fact that Strowger wearing parts are few and simple to replace. This speeds training of maintenance men and makes trouble-shooting easy!

Are you planning a dial conversion? Then get in touch with us. We'll send *your* AE representative in to help you solve your dial conversion problems. He can give you the complete Strowger story. And, he can provide you with information on how to finance Strowger dial equipment. To contact your AE representative, just write Automatic Electric Sales Corporation, Northlake, Illinois. In Canada, Automatic Electric Sales (Canada) Ltd., 185 Bartley Drive, Toronto 16.

**District Manager, Southeastern District, Automatic Electric Sales Corporation*

AUTOMATIC ELECTRIC

Subsidiary of

GENERAL TELEPHONE & ELECTRONICS

GENERAL SYSTEM

Courts and Commissions

Three Wisconsin Companies Given Rate Approvals

The Wisconsin Public Service Commission has approved rate increases for three telephone companies as follows:

Stockbridge & Sherwood Telephone Co., Stockbridge, was granted permission to raise rates by $10,571.

Dodge County Telephone Co., Reeseville, received a $3,034 increase in rates (TELEPHONY, Apr. 8).

An increase of $3,595 was approved for the New Franken Telephone Co. (TELEPHONY, May 6). The New Franken company had requested a raise of $6,672.

Southern Bell Asks Revision Of L. D. Toll Rates in Tenn.

The Southern Bell Telephone & Telegraph Co., on June 29 filed a petition before the Tennessee Railroad & Public Utilities Commission to revise its rate schedule for long-distance calls within the state.

"The toll rate schedules filed, which shorten some initial talking periods while lengthening others, were designed to make station-to-station calling more attractive to toll users by providing a lower rate for the initial period for most station-to-station calls within the state," Southern Bell general commercial manager, J. M. Brown, stated.

"A wider differential between person-to-person rates and station-to-station rates resulting chiefly from lowered station-to-station charges is proposed in the petition," he said.

While there will be some small increases in the initial period in person-to-person rates, in most cases these rates would be reduced, according to Mr. Brown.

Under the proposed rates, the company's subscribers have the choice of making long-distance calls at a substantial reduction in the cost through the greater use of station-to-station calls; or of making calls on a person-to-person basis at a slightly increased cost in some instances.

The Southern Bell petition stated that under the proposed new rates, customers will be able to make two station-to-station calls for the price of one person-to-person call. The initial period intrastate station-to-station rates will be as low, or lower than, the initial period rate for interstate calls of the same distance, Mr. Brown said.

The commission was to set a date for a hearing on the petition.

NW Bell Plans Raise of Intrastate Toll Rates in Ia.

The Northwestern Bell Telephone Co. was to adjust its rates for intrastate long distance calls in Iowa, effective July 1.

The changes would mean that the initial 3-minute rate on person-to-person calls over 16 miles within Iowa will be increased over present charges by from 11 to 29 per cent.

There will be no increase in the base rate for station-to-station charges.

Also, the lower rates which have applied to person-to-person calls over distances beyond 54 miles after 6 p.m. and on Sunday and holidays will be discontinued.

The charge per minute beyond the initial 3-minute period on both person-to-person and station-to-station intrastate calls will be computed to the nearest lower penny instead of to the nearest lower nickel as presently done.

The company reported that the cost of handling an average person-to-person call is more than twice that of a station-to-station call.

Enact Telephone Fraud, Party Line, Damage Bills in Tex.

Three bills of interest to the telephone industry have been enacted in Texas.

They deal with obtaining service under false pretenses, refusal to surrender a party line in an emergency, and damage to telephone equipment.

Senate Bill 309 sets the penalty at one year in jail, a $1,000 fine, or both for obtaining telecommunication services through the use of false, unauthorized or fictitious telephone numbers or credit card numbers. Also covered are use of a code or prearranged scheme or any other trick or false representation used to obtain telephone service.

Senate Bill 366 provides that a fine of not less than $25 or more than $500 be levied against anyone convicted of refusing to give up a party line in an emergency. The law requires that a notice to this effect must be published in every telephone directory. In addition, a notice of the provisions of this bill must be mailed once a year to each subscriber.

House Bill 921 makes it a felony for anyone to intentionally break, cut, pull, tear down or injure any telephone, telegraph or electrical transmission wire, post machinery or other attachments to such line, or to obstruct or interfere with the transmission of messages or electricity along such line.

Penalties are from two to five years in the penitentiary or a fine of from $100 to $2,000.

Approve Sale of Mutual in Illinois, OK Stock Issue

The Illinois Commerce Commission on June 28 approved the petition of the LaFayette Mutual Telephone Co. to sell to the Mid Century Telephone Cooperative, Canton (TELEPHONY, June 10).

•

Also in Illinois, Viola Home Telephone Co. on July 6 was authorized to issue 5,020 shares of its $10 par value common stock, having an aggregate par value of $50,000 (TELEPHONY, Apr. 29).

Authorize $892,400 Raise For General of Kentucky

The Kentucky Public Service Commission on June 22, granted General Telephone Co. of Kentucky, Lexington, an annual rate increase of $892,400—less than half of what the company had sought (TELEPHONY, Sept. 24, 1960).

General Telephone had asked the commission to approve a rate increase of $1,989,900. The company's customers in the central, southern and eastern parts of the state have been paying the company-proposed rates since last September.

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		3	6 pr.	2	3 pr.	18	22
521-110	1A & 2A	3	6 pr.	2	3 pr.	18	22
521-120	3	6	3 or 6 pr.	6	3 pr.	100	22
521-136	3A	6	3 or 6 pr.	6	3 pr.	100	22
521-166	4	10	3 or 6 pr.	10	3 pr.	400	22
521-183	4A	10	3 or 6 pr.	10	3 pr.	400	22

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Catalog Number	Protected Terminal Blocks, Without Leads
81-175	Reflective warning sign.
81-280	3 pair, with 41-285 arrester.
81-281	6 pair, with 41-285 arrester.
81-285	3 pair, with 41-610 arrester.
81-286	6 pair, with 41-610 arrester.
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company must refund the difference between the September rates and the approved rates.

Frederick Rahdert, president of General of Kentucky, said the refunds would be made within two months. He also said his company would continue its expansion plans "within the amount of revenue improvement allowed by the commission. We have no desire, nor do we at this moment intend, to curtail any expansion plans, or projects which are related to development of communities we serve."

FCC OK's Mobile Station For General of Kentucky

The General Telephone Co. of Kentucky, it was reported on July 6, received a permit from the Federal Communications Commission to construct a mobile telephone base station at its main exchange building, in Lexington. Construction of the base station was to start immediately and it was expected that mobile service would be in operation in early August, upon installation of mobile units in customers' cars.

Approved Rates Give 6.5% Return to Wis. Company

The Wisconsin Public Service Commission has approved a $2,476 rate increase for the Strum Telephone Co. (TELEPHONY, Apr. 22). This, it was reported on July 4, will bring the company's rate of return to 6.5 per cent as compared to 4.4 per cent earned under old rates.

The Strum company had sought an increase of $4,884 yearly. It serves 242 urban and 174 rural stations.

Pass Fraud Bill in Ill.

A bill providing a $1,000 fine for defrauding a telephone company of its lawful charge for telephone service by use of phony credit cards, charging calls to non-existent numbers, etc. was reported on July 6 to have passed both houses of the Illinois State Legislature, and was awaiting Governor Kerner's signature. The bill was sponsored by the Illinois Telephone Association.

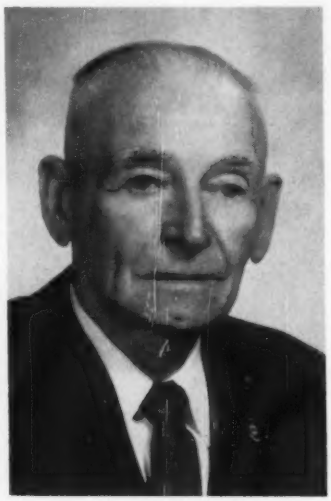
Ask Sale OK in Arkansas

R. L. Thompson and Charlotte Vaughn Thompson have asked the Arkansas Public Service Commission for permission to sell the United Telephone Co., Alma, to the Ozark United Telephone Co., a Delaware corporation, in exchange for common stock.

Fuerst Retires; Hix Heads United Company of West

After nearly 65 years in the communications field, Otto Fuerst, president and general manager of the United Telephone Co. of the West, Scottsbluff, Neb., retired from active service on June 30.

Effective July 1, Mr. Fuerst became chairman of the board, and Verne E. Hix assumed the presidency of this Nebraska subsidiary of United Utilities, Inc.



OTTO FUERST

Altogether, Mr. Fuerst has served in the Independent telephone industry continuously for 58 years.

Recalling his long career, a sleet storm in 1896 at Norfolk, Neb., provided Mr. Fuerst with his first job in the communications industry, that of lineman on railroad telegraph lines. It was seven years later, in 1903, that he made the decision to associate with the Norfolk Long Distance Telephone Co.

In 1907, he began his long tenure of management responsibilities as plant superintendent of the Norfolk Long Distance company.

In 1911, he became manager of the Platte County Telephone Co., Columbus, Neb., and in 1918, was plant superintendent of the Wyoming-Nebraska Telephone Co., in charge of establishing toll leads between Nebraska and South Dakota.

Then, in 1919, Mr. Fuerst moved to Scottsbluff, as plant superintendent of the Platte Valley Telephone Co. At that time, the company was served entirely by magneto switchboards, and all exchanges were served by one grounded toll line extending east and west from

V. E. HIX

Scottsbluff. The Platte Valley company was acquired by the United System in 1953, and the name was subsequently changed to the United Telephone Co. of the West. All exchanges are now dial operated with nationwide direct distance dialing available to subscribers. In addition, over 150 toll circuits provide long distance service.

Mr. Fuerst served as the resident operating head at Scottsbluff for nearly 30 years. He was elected president and general manager of United Telephone Co. of the West in 1958.

Mr. Hix, the new president of the United System, was named assistant to the president of the United Telephone Co. of the West in March, 1961. Prior to that assignment, he was general commercial manager of United Telephone Cos. of Missouri, Kansas and Arkansas, Kansas City. He has been with the United companies and predecessor companies since 1939.

Following education in Iowa, Mr. Hix entered the telephone industry as a lineman with the Iowa State Telephone Co. in 1939.

After serving in the South Pacific Theater with the Army Signal Corps from 1942 to 1945, he transferred to the Central Missouri & Arkansas Associated Telephone Cos., at Warrensburg, Mo., as plant superintendent. When these properties were merged with the United System in 1954, he transferred to the Kansas City office as purchasing agent and plant engineer for United Telephone Cos. of Arkansas, Kansas and Missouri.

Mr. Hix was promoted to outside plant and staff engineer in 1956, and was named general commercial manager of the three operating companies in 1958.

AT&T Satellite to be Fired Under U. S. Contract

The national space agency is reported to be planning to enter into a contract soon to launch an experimental communications satellite developed and built by the American Telephone & Telegraph Co.

It is reported that, under the agreement, the National Aeronautics & Space Administration (NASA) will provide the launching facilities, the launching rocket and network for tracking the satellite in orbit. The AT&T will reimburse the government for the cost of the launching.

The project represents the entry of private enterprise into space, for until now, all satellites have been financed by the government. The arrangement also could set the pattern for future private satellites.

The AT&T will be subject to supervision by the space agency, and according to agency officials, the experiment will be "integrated" into the government's program for development of a communication system.

The space agency is reported to have established requirements on the nature of the satellite, the experiments it would carry, the time of launching and coordination with the government program.

James E. Webb, NASA chairman, recently said that general agreement had been reached and that a final contract was expected to be signed in the near future.

With the AT&T experiment, the United States should have two experimental communications satellites in orbit by next summer.

The other is the relay satellite being developed by the Radio Corp. of America under a contract with the space agency as a government-financed experiment.

In general size and principle of operation, the two satellites will be similar. They differ, however, in their development objectives.

The AT&T views its satellite as a prototype for an operational communications system, while the other satellite is designed as an experiment to answer such questions as the reliability of electronic components under space conditions.

Rocky Road

"It is not ease, but effort—not facility, but difficulty, that makes men. There is, perhaps, no station in life in which difficulties have not to be encountered and overcome before any decided measure of success can be achieved."—SAMUEL SMILES.

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Lightning and Power Trouble

By L. N. MARTIN

PART 81. The preceding article in this series appeared in the June 3 issue.

WHEN THE WRITER first solicited telephone business in rural areas he frequently met with the following type of sales resistance: "I would like to have a telephone, but I am afraid of lightning coming into the house on the telephone wire. I know that lightning will follow a wire. Last Spring I had seven head of cattle killed by one stroke of lightning. They were standing against a wire fence in the far corner of the pasture. The lightning struck nearly a quarter of a mile away. I have heard of houses being set on fire by lightning coming in on the wire and I know of a case where a man was killed by lightning while he was using a telephone."

This farmer's fears were well grounded. Such accidents did happen. There was no lightning protection whatever on the first telephone plants that we saw and the first "lightning arresters" that appeared were worthless.

Subject of Long Study

Man has feared lightning as far back as history records or tradition tells its story. It was a terrible and mysterious force against which man had no defense. It was believed to be the work of some malevolent god. When science began to replace superstition, men of scientific minds tried to find some physical cause for lightning. The most prevalent theory was that lightning was an explosion of gases that were formed in a storm cloud.

Man's first primitive knowledge of electricity goes back to antiquity. Some time during the century 600 to 500 BC the Greeks discovered that when a piece of amber was rubbed with fur it acquired the ability to attract and hold small light objects such as feathers or bits of paper. The new force was named "electricity," from the Greek word for amber. However, about 23 centuries passed before any practical use for electricity was found.

In this courtry, during the Colonial years, many scientific men were studying electricity. Foremost of these was Benjamin Franklin (1706-1790). Franklin was a remarkable man in many fields and was far ahead of his time in science. He practically discovered the electronic theory of electricity but this was overlooked by other scientists until it was rediscovered in recent years.

Generated by Friction

In Franklin's day electricity was generated by friction. The classic experiment was to generate a positive charge by rubbing a glass rod with a silk handkerchief, or a negative charge by rubbing ebonite with wool. A "frictional electric machine" was developed which did this automatically and continuously. A glass disk, 3 or 4 feet in diameter was turned like a grindstone by a crank at its center. As the disk revolved, it rubbed against a silk pad, then against a metal comb. The pads and combs alternated around the circumference of the moving wheel. Electricity was generated as the wheel rubbed a pad and was taken off by the comb which followed. The combs were connected together and formed the output of the machine.

The Leyden jar had been invented. This was an early form of what is now called a condenser or capacitor. A battery of Leyden jars could store the electric charge produced by the electric machine and, thus, a very high (and dangerous) voltage could be produced. If wires from the two poles of the Leyden jar were brought towards each other, a spark would leap several inches through the air with a bright flash and a loud crack.

The exploding gas theory of lightning still prevailed, but Franklin noticed that the discharge of a Leyden jar looked exactly like a miniature bolt of lightning, and he formed the theory that lightning was an electrical phenomenon. Even in that day, a scientist had to prove his theory, so in 1752 Franklin performed the famous kite experiment.

Important to Telephony

He flew a kite up into a storm cloud using a small copper wire instead of the conventional string. The electricity thus obtained from the cloud was stored in a battery of Leyden jars. He then performed all of the experiments known to science at that time and proved that the charge obtained from the cloud was exactly the same as that produced by an electric machine. *Lightning was electricity!*

This fact, discovered and proved by Franklin, is of great importance to telephone people. Since lightning is electricity, it obeys all the well established laws of electricity. It is no longer a *mysterious*, uncontrollable, and unpredictable force. Of course, one cannot predict just when and where a cloud will develop such a high voltage with reference to the earth that it will break down the 500 or 1,000-foot air gap and form a stroke of lightning. However, any building or equipment may be effectively protected from such a bolt if it does occur, and much may be done to prevent the stroke.

Practical Scientist

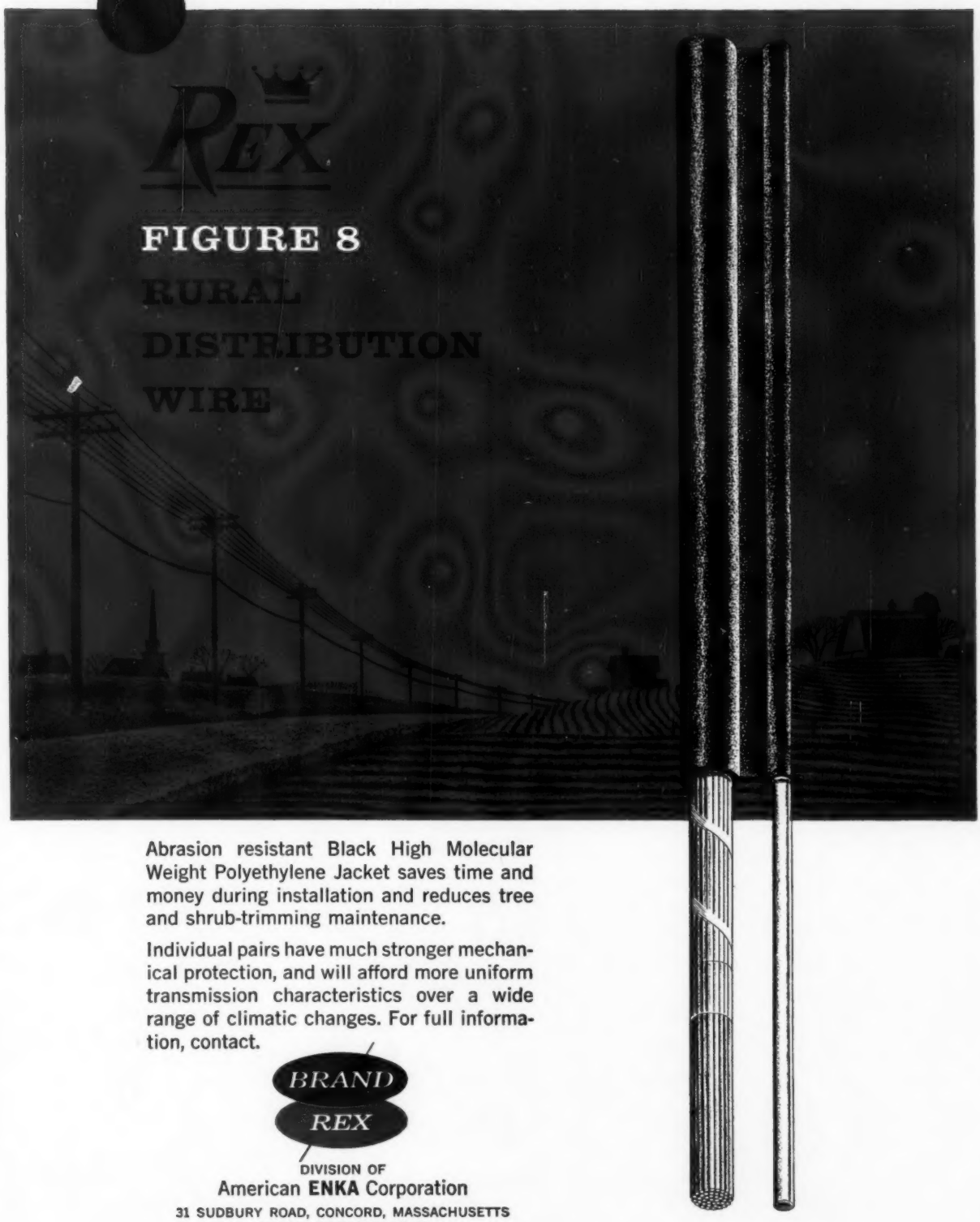
Franklin was a very practical man. He wanted to turn his discovery into something that would be of practical benefit to mankind. He invented the lightning rod. This invention is of interest to telephone people because the lightning rod is basically a "ground rod" or "ground wire."

The lightning rod was discredited for a time because the business of selling and installing rods fell into the hands of unscrupulous high pressure salesmen. Ornaments were added to make the rod look expensive; also various gadgets that were said to have some magic power over lightning. The rod was twisted to satisfy the popular belief that lightning travels in cork screw fashion. (Lightning prefers a straight line when that is possible.) In the meantime the portion of a rod that is unseen by the purchaser (the part that goes into the ground) often extended only a few inches into dry earth. An important requirement for any ground rod is that it must at all times make good contact with moist earth.

The lightning rod, when properly designed and installed, saves much property and many lives. The hard-headed fire insurance companies recognize this fact by offering a reduced premium when the building is "rodded."

(Continued on page 50)

Reduce Installation and Maintenance – Use . . .



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Virginia Independents and Bell System meet

At the opening of the recent Committee meeting in Edinburg, members paused for this group photograph. Seated (l. to r.): Bill Quinlan, John Van Liew, J. S. Day, W. R. Carroll, J. B. Spratley, Aldrich Dudley, Jr., Warren French, Jr., Ted Keck, Cliff Robertson, Jim Hite (guest) and John Barringer (guest).

Midway in the Edinburg meeting, John Van Liew, of the Virginia Telephone & Telegraph Company, discussed toll circuit layout cards while several Committee members listened attentively.

to improve transmission and communications

Throughout the United States, many Independent Company-Bell System joint committees are continually working together to strengthen the world's most efficient and economical communications network.

One of these groups is the Virginia Independent Telephone Association-Chesapeake & Potomac Transmission and Communications Improvement Committee.

Bi-monthly, the nine members meet and act as a clearing house for transmission and communications matters which affect both the Bell System and the Independent telephone companies in Virginia.

The agenda of a recent Committee meeting illustrates how the group operates. Warren French, Jr., General Manager of the Shenandoah Telephone Company, served as host in his Edinburg, Va., offices.

A total of 17 subjects were discussed, ranging from difficulties experienced on single frequency signaling to a demonstration of new self-supporting cable.

Through the efforts of this Committee, all Virginia telephone companies recognize more than ever the need for good transmission and communications.

Multiply this awareness by all the states in which Independent-Bell System committees are functioning and the result is increasingly better service to millions of telephone subscribers.

BELL TELEPHONE SYSTEM

A demonstration of new pressurized cable was made to the Committee by Ted Keck of C & P of Virginia. This was one of 17 items discussed by the group during the Edinburg session.

Committee visits nearby Independent Company

Harry P. Cavendish, Vice-President of the Harrisonburg Telephone Company, Harrisonburg, Va., told the Committee that their reports made his Company more aware of transmission difficulties and how to correct them.

The progressive Harrisonburg Telephone Company is one of the nearly 50 Independents in Virginia which receives reports and recommendations from the VITA-C & P group.

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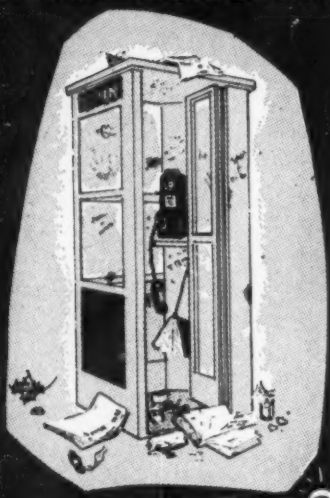
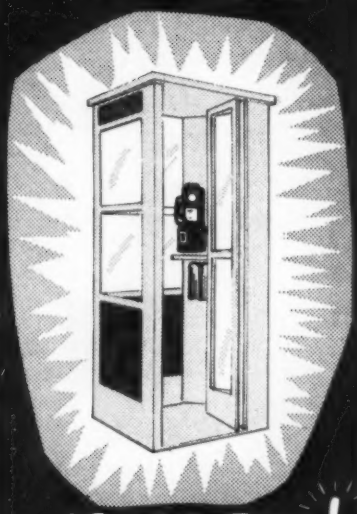


LOOK LIKE THIS?



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Many early telephone men had little electrical knowledge. In the matter of protection against lightning, they were inclined to believe some of the superstitions and "old sayings" about this subject that were still very popular. The first station protectors that we saw in use consisted of a one-fourth amp. fuse. This was mounted in brass clips on a porcelain block. The fuse wire was about three-fourths of an inch long and the mounting about 4 inches over-all. Very many of these "lightning arresters" were sold and installed.

The theory was that lightning would blow the fuse, leaving a ¾ inch air gap which it could not cross, therefore, the instrument and the building would be saved from damage. Offered as a proof of the efficiency of this device, was the fact that these fuses would blow when the lightning was miles away. All of this was very faulty thinking.

If a stroke of lightning had enough voltage behind it to break down and penetrate 1,000 feet or more of air, would it stop or even hesitate at a ¾ inch air gap? Also lightning is so fast that it would do its damage before the fuse wire had time to melt. The replacement of these fuses was a problem as hundreds of them were blown in every storm. This was partially solved by giving each subscriber a small supply of fuses and letting him replace them himself.

Integral Part of Set

The first carbon protector that we saw was supplied by the manufacturer as an integral part of the magneto telephone. It was mounted at the top of the telephone near the line and ground binding posts, or, in some cases, on the side of the instrument. The latter position was not so desirable as lightning would have to make several right angle turns to reach the ground and that is something that lightning does not like to do. This was a good protector but the best position for a station protector is outside of the building.

Time passed and the large companies began to attack the lightning and power contact problem in a scientific manner. "Protection Engineering" became an important branch of telephone engineering. The protection engineers are concerned with trouble caused by lightning, contacts with power wires, contacts with other foreign wires, induction from power circuits, the secondary or inductive effects of lightning, and electrolysis. As protection often involves methods of construction as well as the installation of protective equipment, the plant construction engineers are also involved in this work.

These engineers thoroughly understand the laws and mathematics of electricity and they work out their problems on the drafting board and in the laboratory. Each new idea is then given a field trial and the results are recorded. When an improved protection method or equipment has been "proved in," specifications or "practices" are written in language that can be read and understood by any workman.

Enter Cable Protection

These engineers are doing a good job. Damage to telephone plant, or to the property of others, is now very rare, and when it does occur the investigation often determines that the practices were not followed to the letter or that the protective equipment was not properly maintained.

When cable began to replace open wire distribution, lightning and power often entered the cable via one or more working pairs and caused much cable trouble. Methods of locating cable trouble were crude and large groups of subscribers were often out of service for several days. Protection engineers have turned their attention to this problem and they are very successful in keeping foreign currents and lightning out of the cable.

Now it is obvious that only the largest Independent companies, Bell companies, and the REA can have their own protection engineering department and write their own protection practices. Too many small companies are trying to use their own ideas on this subject and are, therefore, losing the advantages of the large amount of engineering that has already been done.

Advice for Small Companies

Our advice to the small or medium-sized company is: Obtain the protection practices of one of the very large Independent companies, Bell System Practices, or REA specifications. Then *follow these practices to the letter,* even though the reasons for some of the requirements may not be fully understood. Remember, these practices have been proved in by actual experience. Also, the company should set up an annual inspection to determine that all protective equipment is in place and in good order. (For example: A carbon protector is worthless if somebody has left the carbons out.)

Protection practices are being continuously improved and are, therefore, issued in loose leaf form. When a page or a section is revised, or a new section is written, that page, or section, only is printed or reprinted and distributed to those who are using the practices. Therefore, when obtaining a set of

practices a company should arrange to get on the mailing list for new and revised sections. We do not believe that any company will have any trouble in securing the cooperation of any large company in this matter. When every company improves its service the whole telephone industry profits.

Prompt Service Restoration

What does the subscriber think about lightning and power trouble? As indicated in our opening paragraph, he started out with a wholesome fear of the telephone during an electrical storm. We believe that protection is now so improved that the subscriber is aware of it and has lost his earlier fears. Let us justify his confidence. The subscriber understands that there may be some trouble due to electrical storms, but he expects and is entitled to prompt restoration of service.

City people working in office buildings, stores, or factories and living in apartments have no reason to fear lightning. Telephoning goes on as usual during an electrical storm.

In rural areas lightning is a real danger, but it is not increased by the presence of a telephone.

A farmer should not be caught in the field during a thunderstorm. If that is unavoidable he should not hesitate to lie flat on the ground. The barn, unless rodded, is a dangerous place, as is also a two-story house that is not rodded. In the house, flues, open windows and doors and large metal objects should be avoided.

The light wiring and the telephone are probably the safest things in the house if they are properly grounded. Nevertheless, just to play it safe, we would suggest that the farmer postpone any unnecessary telephoning until the worst of the storm has passed. Lightning may produce loud audio "pops" on a rural line that could damage the ear.

Most men like to know *why* they are instructed to do something in a certain way. They may feel very uncomfortable blindly following a practice when they do not understand the reason for each step. Therefore, in our next article, we expect to discuss some of the basic principles of protection in the hope that it will help some of our readers to better understand the objectives of the practices.

Duty Inescapable

"There are not good things enough in life to indemnify us for the neglect of a single duty."—MADAME SWETCHINE.

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THE Operator's Corner

By MAYME WORKMAN — TRAFFIC EDITOR

HAVING ENGAGED in the field of telephony for more than half a century, both Bell and Independent, it is gratifying to observe the fine relationship which exists between these two segments of the industry. Before the advent of regulatory bodies, there was keen competition for business between the two branches of the industry, which left some scars that took years to erase. Today, Bell and Independent work hand in hand for the welfare of their subscribers and of the industry as a whole.

Each year, the writer's old-time friend, Hale Nelson, vice president-public relations of Illinois Bell, sends her a copy of the Illinois Bell Telephone Co. Annual Report, which is always read with interest.

Looking through the file of Illinois Bell annual reports, I reread President William V. Kahler's review of the 1959 annual report, which should have a message for all the people in the industry.

Quoting from his message:

"A long-time friend is someone we get used to, but sometimes fail to appreciate. The telephone may be a rough parallel to this. Its dependability and usefulness are often taken for granted. Perhaps, this is to be expected, because in our planning, we try to make it so. In the course of any year . . . definite values are added to it. An annual report can appropriately bring these added values into focus.

"We worked to improve reliability—a prime measure of the telephone's value. In this report we cover some of the things we're doing to provide trouble-free service on an around-the-clock basis. Such things as automatic testing of customers' lines from our exchange buildings and use of compressed air in cables to keep out moisture are just two examples. . . .

"Another measure of the telephone's value is in the number of people you can reach. For many years, our rate of gain of telephones has been greater than population growth. The proportion of households with telephones has been rising. . . ."

Speaking of telephone convenience, President Kahler stated, "There is value in telephone convenience in the home, where individual-line service was our best seller. Party lines are declining rapidly, and this means no waiting for your line, and fewer busy signals on your calls. And more families are finding that colorful telephones in the kitchen, bedroom and other handy places around the house are a part of comfortable and pleasant living."

In speaking of caring for growth, Mr. Kahler added that much of the equipment added to the Bell network has provided for service betterments. In several places, the company enlarged local calling areas, eliminating toll charges on many calls. Other installations enabled additional thousands of customers to dial direct to nearby and far-off places. He said that people are finding it as easy to call cross-country as to call across town. This, together with the speed and low cost, has made long distance service increasingly popular for both social calling and business dealings.

President Kahler also pointed out that a businessman measures the value of his communications set-up by how it helps him run his business efficiently. In recent years, the industry has developed, and is marketing, many versatile telephone devices and systems that can be tailored to fit any communications need. Illinois Bell has intensified and broadened the training of its sales people, one objective of which is to increase their knowledge of specific industry needs.

In his summary, President Kahler remarked:

"Greater value comes from an adequate earnings level, too. An earnings improvement has given us elbow room to do many things that would not otherwise have been prudent. It has enabled us to plan and build more effectively for present customer needs and to put to work new technology that brings future long-run economies to all users.

"One example is the way we're making additions to our central office and cable plant. When lower earnings limited the venture capital we could apply to these purposes, we were forced to engineer on a short-term basis. This often meant going back after six months or a year, when capacity was reached, to add more facilities.

"Now when additions are necessary, we're putting in a margin for two or more years' growth. By being able to risk the bigger initial investment for a one-time, longer-term job, we avoid piecemeal operations and save money in the long run. The best thing about this way of doing business is that it means better telephone service for everyone."

While the foregoing was a review of the Illinois Bell Telephone Annual Report for 1959, in many instances, it reflects the situation in the Independent telephone industry, as well.

You may then ask, "How does all of this affect the switchboard operator?"

First of all, it behooves every telephone employe to know all he or she can about the business in which we are engaged.

Secondly, what affects your company affects *you*. The day is long past when we can confine our interest to the department in which we work. Every department is of vital interest, because it takes all departments, working together, to do a successful job of rendering pleasing service to our customers. The rock foundation of every success in business is an over-all knowledge of company operations.

Traffic Questions

(1) At the present time, how many telephone company offices are equipped to handle aviation calls?

(2) What are the three types of trouble reported by operators in a dial office to the plant department?

(3) What method is used in reporting trouble to the plant department?

(4) Whenever a trouble condition is

reported that interferes with the proper handling of calls, should the equipment affected be taken out of service until the plant department advises that the trouble condition is corrected?

(5) Please give examples of trouble conditions that should always be reported to the plant department.

Answers to questions on page 55

Top H. S. Science Students Share in Bell Labs Program

Through the newly initiated "High School Science Student Visit Program," many students across the country, possessors of high scholastic records, and with demonstrated technical interests, are visiting the Bell Telephone Laboratories in New York every other month as guests of the Bell System.

These visiting students—perhaps, the scientists and engineers of tomorrow—and many of their teachers, are sponsored on the trip to the laboratories by operating telephone companies of their areas. Each of the students is selected for the trip by state and local educators, and has taken, or is taking, a course in high school physics.

Forty-two students and 14 science teachers attended the first program at the Murray Hill Laboratories recently. The program for their visit went like this:

First, a Sunday evening get-together dinner at a New York hotel. This was followed by a speech on the "Laboratories and The Place of Science in Our Modern World" by Dr. J. N. Shive, inventor of the photo-transistor and now laboratories director of education and training.

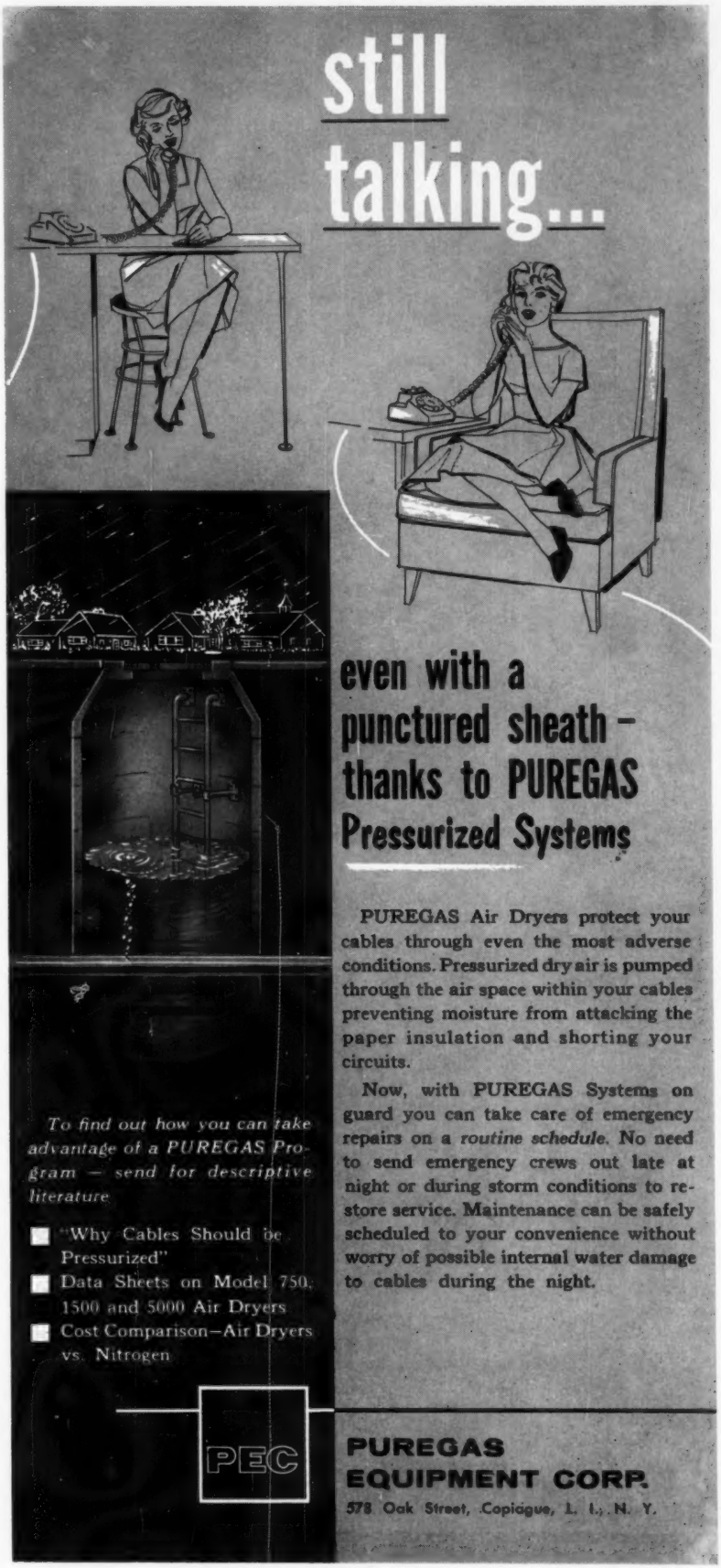
Next, a bus ride to Murray Hill on Monday morning to hear a talk, and see a demonstration in Arnold Auditorium by H. P. Kelly, on a new transmission system based on the use of active satellites.

After a discussion period on the technology of such a system, I. R. Ross, laboratories director of transistor development, described some of the work being accomplished in solid state devices, which is helping to make a satellite transmission system feasible. Much of this demonstration dealt with the theory and operation of the Bell solar cell—the power source for a number of U.S. satellites.

Later, the young guests and their teachers were divided into small groups for a visit to laboratories where much of the work they had been hearing about is actually accomplished. Here, scientists and engineers in the labs described and demonstrated the techniques of their work to each group.

The areas visited were:

The Traveling Wave Tube Laboratory


still
talking...
even with a
punctured sheath –
thanks to PUREGAS
Pressurized Systems
PUREGAS Air Dryers protect your cables through even the most adverse conditions. Pressurized dry air is pumped through the air space within your cables preventing moisture from attacking the paper insulation and shorting your circuits.
Now, with PUREGAS Systems on guard you can take care of emergency repairs on a routine schedule. No need to send emergency crews out late at night or during storm conditions to restore service. Maintenance can be safely scheduled to your convenience without worry of possible internal water damage to cables during the night.
To find out how you can take advantage of a PUREGAS Program – send for descriptive literature
"Why Cables Should be Pressurized"
Data Sheets on Model 750, 1500 and 5000 Air Dryers
Cost Comparison–Air Dryers vs. Nitrogen
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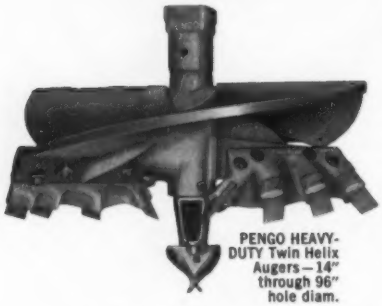
578 Oak Street, Copiague, L. I., N. Y.

PENGO AUGERS

Save you money 4 ways



PENGO HEAVY-DUTY Twin Helix Augers—14" through 96" hole diam.

1 **BORE FASTER**...put real "teeth" in earth drilling, save wear and tear on your diggers.

2 **STAY ON THE JOB LONGER** ...all wearing parts replaceable in the field; no down-time for shop welding.

3 **COST FAR LESS TO MAINTAIN** ...reversible teeth cost only 90¢ each, pilot bit only $8.00. Parts interchangeable on all PENGO augers you are using...less inventory!

4 **A SIZE AND TYPE FOR EVERY DRILLING JOB**

PENGO BORING HEADS for welding to your present auger flights.

PENGO FLIGHT AUGERS and ANCHOR AUGERS—6" through 36" diam.

IF IT'S AUGERS YOU WANT, WE HAVE 'EM—JUST ASK US!

PENGO Augers and Boring Heads are available for all popular types of diggers, from light-duty post hole and farm tractor machines to the largest heavy-duty earth drills. Write today for free catalog; please address Dept. 108.

13-B

PETERSEN ENGINEERING CO., INC.
Santa Clara, California

—the area where the active satellite is being designed.

The Maser Laboratory.

The Solar Cell Laboratory.

The controlled environment area, where experimental transistors are made under "hospital clean" conditions.

At noon, the guests attended a luncheon, and heard Dr. Walter H. Brattain, co-winner of a Nobel prize for his discovery of the transistor effect, speak on "The Life of a Scientist."

The laboratories' basic research programs were explained to the guests during the afternoon.

Leon Harmon of the laboratories' visual and acoustics research department described and demonstrated the work being done in neural electronics—a program designed to investigate more thoroughly the human links in a communications chain. Electronic analogs of nerve cells are used to investigate the possible information processing in the biological nerve system.

After a general discussion and question period in the auditorium, students, teachers and operating company representatives returned to New York City. The day had been a busy, but "memorable" one.

The science students from New York, New Jersey, Connecticut, Rhode Island, Massachusetts, Michigan, Missouri, Texas, Illinois, Kentucky, and Pennsylvania then departed for home with a new insight into modern day technology.

Book Review

"UNDERSTANDING CAPACITORS AND THEIR USES"; by W. F. Mullin; 96 pages; 5½ x 8½; $1.95.

"Understanding Capacitors and Their Uses" is designed to take the misinformation and "mystery" out of capacitors. Written in everyday language, this new book explains the principles of capacitor operation, describes the physical make-up and construction of various types of capacitors, and tells where different types are most often used, and why. It explains the points to consider in selecting suitable replacements, and includes practical information on how to test capacitors for opens, leakage, shorts, value, power factor, etc., and how to measure their values.

While the book fully discusses capacitor theory, its main purpose is to answer in practical terms the questions which arise in the mind of anyone who works with, or studies, electronic circuitry.

Six comprehensive chapters are titled:

What is a Capacitor?
Capacitor Theory

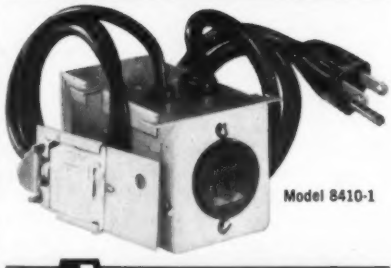
OUTDOOR BOOTHS EARN 400% MORE WITH PRECISION LIGHTING

Major companies prove this. Booths earn four times as much with *Precision automatic on-at-sunset, off-at-sunrise lighting* of interiors and signs. At a cost in pennies!

Built to telephone company standards, this UL-approved control installs in minutes without special tools—out of sight, out of reach. It pays for itself in higher income, longer lamp and starter life, insurance against vandals and vagrants, and savings on lighting energy.

Lights are always on when needed, off when they aren't needed. One Precision control serves one or more standard, "compact," or drive-up booths.

Specify Precision photocontrols on your orders for Alcoa or Reynolds booths—or write for data and prices.



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PRECISION
MULTIPLE CONTROLS, INC.
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The difference between night and day

Capacitor Construction
Capacitor Application
Capacitor Replacement
Capacitor Testing

Mr. Mullin, the author, who is associated with a major capacitor manufacturer, has used his talents to bridge the gap between engineering technology and circuit theory — providing a practical book for technicians, servicemen, and students. This book can be ordered through TELEPHONY.

Answers to Questions On Page 52

(1) At the present time, five telephone company offices are equipped to handle aviation calls: Chicago, Detroit, New York, Pittsburgh, and Washington, D. C.

(2) The conditions to be reported are of three general types, as follows:

a. Equipment trouble observed by operators.

b. Trouble indications encountered by operators on toll and DSA calls.

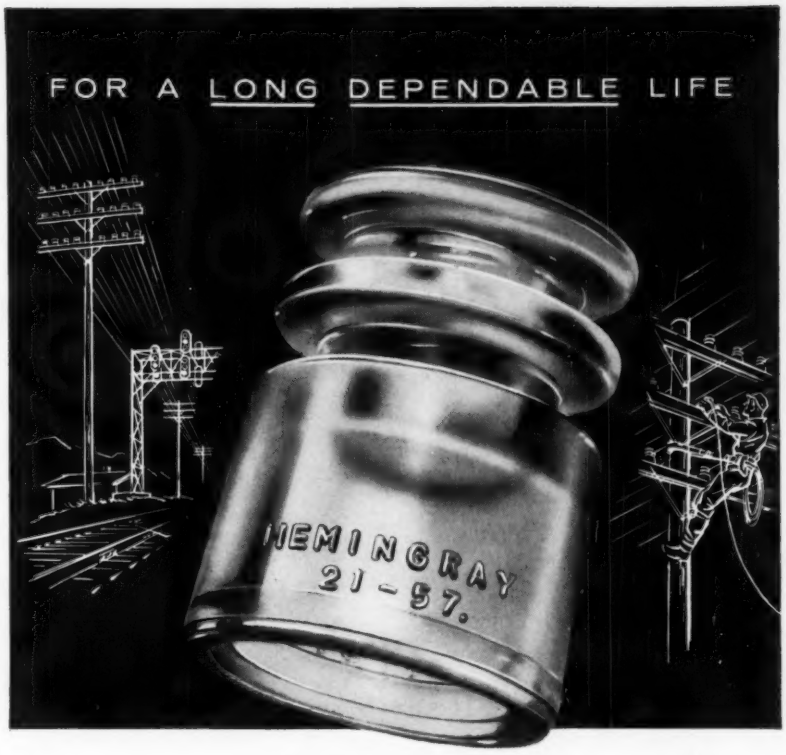
c. Trouble indications reported to operators by customers on calls they have dialed.

(3) The method of reporting is either verbally to the plant department, or by a trouble ticket written and forwarded to the plant department, as agreed upon locally.

(4) When a trouble condition is reported that interferes with the proper handling of calls, the equipment affected must be taken out of service until the plant department advises that the trouble condition is corrected.

(5) The following are examples that should always be reported to the plant department:

Lamp dim, extinguished, permanent, or operating improperly.
Lamp cap chipped or broken.
Cord ragged, noisy, or cuts out.
Key broken, loose, or missing.
Timing device stopped or incorrect.
Busy or reorder signal does not work properly.
No busy test, or false busy test.
Dial or keyset fails to work properly, or no dial tone.
Inability to register coins or to dispose of coins properly.
Inability to hear or be understood over your telephone set.
Conversation heard on your position circuit when you are not cut in on connection.
Switchboard equipment marred, defaced, or missing.



NUMBER TS-23 - *Designed for carrier circuit use on all "point" type transposition hardware and at intervening non-transposition poles.*

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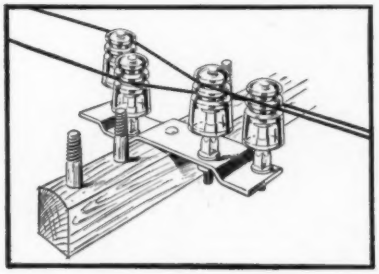
Easily and Economically Installed

Hemingray Glass Insulators stand up under severe conditions, do not deteriorate, provide the service you need to assure continuous operation of communication lines. The dependability of Hemingray Insulators as proved by years of fine performance is one of the reasons behind their world-wide acceptance.

Hemingray has pioneered many insulator developments to keep pace with requirements, improve communication systems, assure you a dependable source of supply.

An up to date distribution system makes Hemingray Insulators available when you want them and where you need them.

Hemingray Glass Insulators are a product of Kimble Glass Company, subsidiary of Owens-Illinois, Toledo 1, Ohio.



This carrier circuit transposition developed by the Bell System takes only the crossarm width of one conventional pin.

World standard for quality Since 1870

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REA Authorizes Six Loans Totaling $881,000

TELEPHONE LOANS approved by the Rural Electrification Administration during the period June 19 to July 5 will help provide new or improved service for 1,350 subscribers, as follows:

Consolidated Telephone Cooperative, Dickinson, N. D., $67,000; June 20.

This new borrower of REA funds was recently formed by the voluntary consolidation of two cooperatives: the Bowman-Slope Rural Telephone Mutual Aid Corp. and the Dunn Telephone Mutual Aid Corp., Dickinson.

This loan, together with funds from prior REA loans—obtained by the two predecessor companies will help the borrower to furnish initial service to 173 subscribers and to improve service for 17 subscribers. The subscribers who will receive improved service are now served over the subscriber-owned lines of the South Heart Telephone Co. They plan to abandon these lines and to become regular subscribers of the cooperative as soon as dial service is available. A new dial central office will be constructed at South Heart.

With the aid of REA loan funds, the company will be assisted to provide new and improved service to 2,318 subscribers in North Dakota and in South Dakota. Ten of the 11 proposed exchanges are now furnishing dial service to approximately 1,650 subscribers.

John Meisch is president and Thomas E. Harris is manager of the Consolidated cooperative.

•

Star Telephone Co., Maringouin, La.; $258,000; June 30.

These funds, supplemented by $80,000 from future earnings of the borrower, will be used to furnish initial service to 543 subscribers. Facilities required will include expanded central office equipment. Provision also is made in the loan for system improvements which will result in a higher grade of service for existing subscribers.

REA loans to this borrower will help it to bring new and improved service to 2,128 subscribers. The five exchanges of the system now furnish dial service to approximately 1,575 subscribers.

Oregon (Mo.) Farmers Mutual Telephone Co.; $108,000; June 30.

These and funds from a prior loan will aid in improving service for 238 subscribers and in furnishing initial service to 36 subscribers. The borrower proposes to acquire the Farmers Mutual Telephone Co., Forest City, now providing magneto service to the existing subscribers. The dial facilities of the borrower's present Oregon exchange will be expanded to serve the additional subscribers.

The two REA loans to this company will assist in making possible new and improved service to 1,069 subscribers. The borrower is now providing dial service to approximately 700 subscribers from its Oregon exchange.

•

Sand Hills Rural Telephone Cooperative, Jefferson, S. C.; $141,000; June 30.

These funds will be used to help complete the borrower's authorized system, and to make improvements which will mean a higher grade of service for existing subscribers.

The three REA loans to this cooperative will aid it in bringing new and improved service to 2,665 subscribers. The six exchanges of the system are now furnishing dial service to approximately 2,170 subscribers.

•

DeKalb Telephone Cooperative, Alexandria, Tenn.; $115,000; June 30.

These funds will be used to aid in improving service for 123 subscribers and in furnishing new service to 13 subscribers. The borrower has recently acquired the New Middleton Telephone Co. These funds will help to rehabilitate, expand and integrate these facilities. Additional central office equipment will be required to serve the expanded area. The New Middleton subscribers will be served from the borrower's existing Gordonsville exchange. A portion of these loan funds will be used to help complete the cooperative's authorized system.

REA loans to this borrower will assist it to provide new and improved service to 3,889 subscribers. The nine exchanges of the system are all in operation serving approximately 3,375 subscribers.

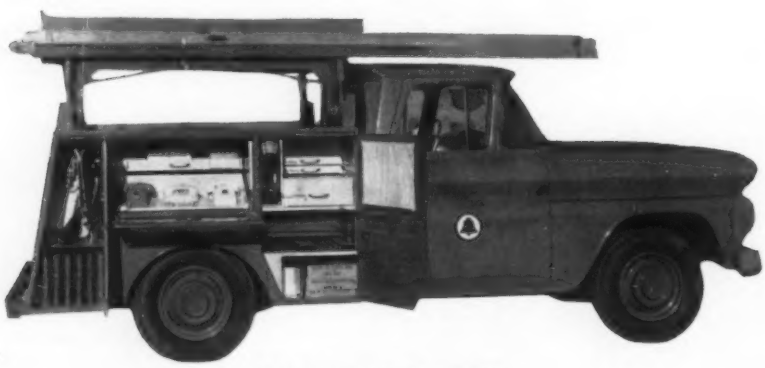
•

Colorado Valley Telephone Cooperative, LaGrange, Tex.; $165,000; June 30.

This loan will help to improve service for 39 subscribers and to furnish initial service to 168 subscribers in and around the town of Borden. The borrower proposes to create a new exchange and to construct a new dial

VERSATILE TRUCK BODY

Fits any standard ½-ton cab and chassis with "CA" dimension "39-43"; permits greater vision, better load distribution, yet affords desired compartmentation and flexibility. Can be used for station installation, station repair (including part time cable repair) and combination work.



SU 76 TRUCK BODY

Manufacturers and Distributors

STEELWELD EQUIPMENT CO., Inc.

ST. CLAIR, MISSOURI

central office at Borden in order to serve the additional subscribers.

REA loans to this borrower will aid it in bringing new and improved service to 977 subscribers. The system when complete, will consist of four exchanges. The borrower anticipates that the Hostyn, Plum and Warrenton exchanges will be in operation by December 1961.

IN THE NATION'S CAPITAL

Continued from page 18

bookie operations around the country, but don't bet on it.

USITA Against Anti-Gambling Bills

The Justice Department and the Congress are intent on tightening the reins on interstate gambling, and bills designed to do this are pending in the House. However, they have not received enthusiastic reception from the telephone industry.

Before adjournment of the House Judiciary Sub-committee hearings on HR 6573 and HR 3022, the proposed anti-gambling measures, the United States Independent Telephone Association went on record opposing the legislation in its present form.

Speaking for the association, Attorney Bradford Ross filed a statement which pointed out that "Independent telephone companies are as much opposed to gambling as anybody could be" but "efforts to control gambling should neither unjustly place these public service enterprises in the position of seeking to avoid criminal sanctions at the expense of subjecting themselves to regulatory criticism or civil damages nor force them to act as policemen and informants."

USITA feels that the proposed bills would place an unfair and unreasonable burden on telephone companies. Hearings were adjourned last month by Subcommittee Chairman Emanuel Celler (D., N. Y.), but it is likely they will be reopened before the close of the present session.

Hoffa Big Telephone Customer

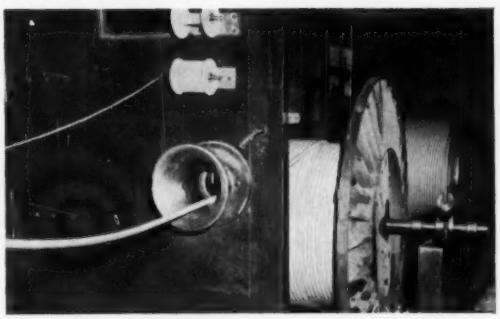
The Chamber of Commerce of the United States reports that it cost the rank and file teamster association duespayer $767 per minute for Jimmy Hoffa, teamsters' union president, to get the party line out to 119 cities. Hoffa set up a 10-minute, long distance conference call from Washington to 119 cities throughout the country on Apr. 9 to lobby for a pet teamster bill, S. 1197, to amend the Interstate Commerce Act. According to the chamber, the cost of the call was $7,670, alleged to be the biggest ever recorded.

At their recent Miami Beach con-

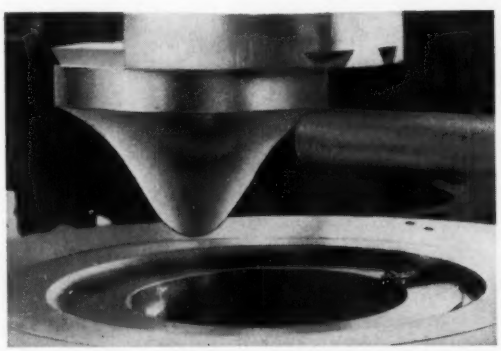
How Kennecott Builds Extra Life into Telephone Cables

Constantly striving to improve their telephone cables, Kennecott's research and production team has established a three-step procedure that provides an exceptionally reliable and trouble-free cable.

1. VACUUM DRYING — For dependable performance it is essential that the paper insulation of telephone cables be properly dried prior to the application of the lead sheath. That is why the insulated core of every Kennecott telephone cable is thoroughly dried under controlled elevated temperatures and high vacuum in a sealed chamber.



2. PAYOFF OVEN — To maintain this dryness after removal from the vacuum chamber the reels are transferred to a payoff stand in an oven adjacent to the lead press. This manufacturing procedure prevents moisture from reentering the insulation while the lead sheath is being applied.



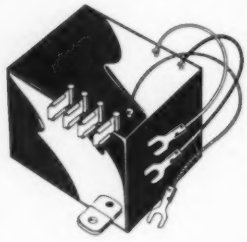
3. YOUNG PROCESS—To enclose the cable in a lead alloy sheath that is uniform in strength and structure throughout the entire length of the cable, Kennecott uses an exclusive method of recharging the press cylinder—the Young Process. This technique removes the sulphides, oxides, and other impurities ordinarily present between charges. Thus each press charge readily and completely unites with the preceding charge, eliminating any possibility of defective welds.

For more information about the Young Process and for full details on Kennecott's Unit Type Paired Exchange Telephone Cable, send for your free copy of illustrated Bulletin 3001. Kennecott Wire and Cable Division, The Okonite Company, Phillipsdale (Rumford 16), R. I.

KENNECOTT-OKONITE TELEPHONE CABLE

END RURAL TRANSMISSION PROBLEMS . . .

obtain top quality/low cost transmission amplification for distant subscribers on existing facilities and new cable installations of small gage. The Teletek 501 is a miniaturized transistor **Telephone Line Subscriber Amplifier,** easily installed in 500 type sets and A.E. pay stations. Immediate amplification gain of 12db (transmit) and 15db (receive) using only regular line voltage.



Installed and tested in existing sets in seven min. maximum. Size: 1.4x 1.78x1.5 inches/Epoxy encapsulated/weight: 5½ ounces. Field proven reliability

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NEW TOOL "SNAPS" OFF COVERS

Wiring is always accessible in Pancake Overfloor Raceways. And Wiremold's new 656 Cover Removal Tool makes it even easier to get at wiring, or to relocate Pancake 1500 and 2600 systems. Every installer should carry this work-saving tool.

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ADams 3-6251

vention, the Teamsters boosted Hoffa's salary from $50,000 to $75,000, ordered the union to pay *all* of his expenses, on and off the job; authorized the treasury to purchase houses for Hoffa and other union bosses, and gave Hoffa tighter control of the union and its funds. It's nice work if you can get it. You may be sure of one thing, a young man named Kennedy (Bob, that is) sitting in his office in the Department of Justice Building bristled when he read this in his morning newspaper.

50th Anniversary of Radio Regulation

July 1 marked the 50th anniversary of radio regulation.

Starting in 1911 with single offices in Baltimore, Md., and two other cities, the first regulatory agency was launched as the Radio Division of the Department of Commerce, after enactment of the Wireless Ship Act which required all ocean-going passenger ships with 50 or more passengers to install sending and receiving wireless equipment. From three inspectors at the inception of this Commerce Department Division, the Federal Communications Commission now has 1,200 employes, 400 of them in the field service. The FCC, which is, itself, only 27 years old, inherited all radio regulation duties.

The wind which blew out the 50 candles on an FCC birthday cake carried with it a rumor that President Kennedy is gunning for the FCC commissioners who opposed his reorganization plan. Since no vacancies occur until 1963, he'll have to bide his time, or find some cause for bouncing his opponents.

Bar Association's Utility Section to Hold Meeting

The members of the Section of Public Utility Law of the American Bar Association will hold a three-day meeting Aug. 7 to 9 in St. Louis, Mo.

As announced by Section Chairman Alfred P. Ramsey of Baltimore, the first general session will meet in the Zodiac Room of The Chase Hotel at 2 p.m., Aug. 7. It will feature two well-known personalities in the field of regulatory and administrative law: Chief Judge E. Barrett Prettyman of the U. S. Court of Appeals for the District of Columbia Circuit, who will speak on the "Administrative Conference of the United States;" and the Honorable James M. Landis, special assistant to President Kennedy on regulatory matters, who will discuss "The Revitalization of the Administrative Process."

Judge Prettyman has been appointed

by President Kennedy to be chairman of the newly created Administrative Conference of the United States.

Also at this first general session will be the presentation of the section's annual project: the "Report of the Standing Committee to Survey and Report as to Developments during the Year in the Field of Public Utility Law."

This committee, headed this year by William S. Tarver of Birmingham, Ala., annually reviews and analyzes new decisions, new laws, and other events in the area of utility regulation during the preceding 12 months.

At the second general session, Aug. 8, at 2 p.m., the vice chairman of the section, Stephen H. Fletcher of New York, will preside over a meeting devoted to railroad and fuel energy problems.

Earlier during the day of Aug. 8, members of the Section of Public Utility Law have been invited to attend sessions of the Section of Antitrust Law at the Statler Hotel where antitrust problems in the utility field will be discussed.

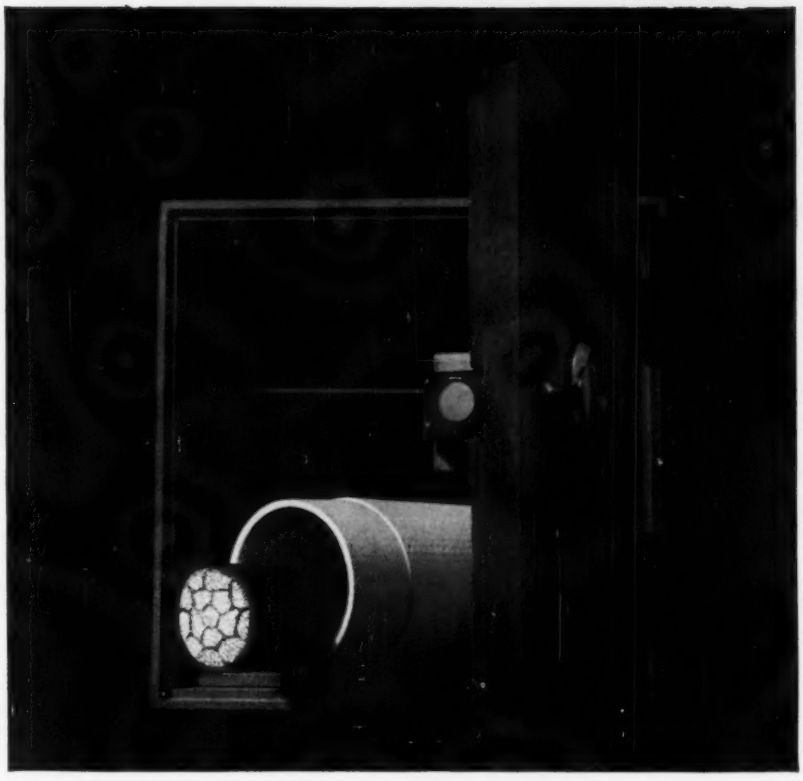
In its final general session, on Aug. 9, at 10 a.m., Chairman Ramsey will preside over a session devoted to "Mergers as a Means of Strengthening Common Carriers in the Face of Competition and Regulation." Speakers will give the respective viewpoints of the railroads, airlines, and trucking industries.

Butter Instead of Bombs

"A time will come when the science of destruction shall bend before the arts of peace; when the genius which multiplies our powers, which creates new products, which diffuses comfort and happiness among the great mass of the people, shall occupy in the general estimation of mankind, that rank which reason and common sense now assign to it."—ARAGO.

Safeguard Freedom

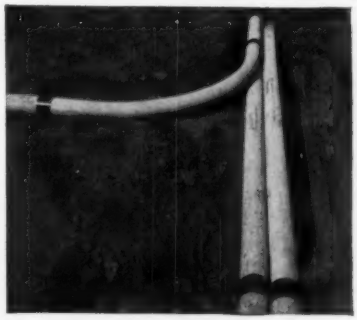
"It is not an exaggeration to say that the two chief duties of a government are: First, to ensure freedom for all, and, second, to prevent weaker members of society from losing it through the action of the strong. To prevent exploitation of man by man is not a curtailment of freedom, but a safeguard of it. What kills personal freedom is the assumption by the State of the power to choose for individuals what they have the right to choose for themselves."—*The Freeman.*



Safeguard cables permanently at the lowest cost with J-M Transite Ducts!

Transite® Ducts, made of tough, durable asbestos-cement, provide rust-free, corrosion-resistant protection for the life of your telephone cables. And, they can be installed, operated and maintained at the lowest possible cost!

Available in 10-foot lengths, light-weight Transite saves installation time and requires smaller installation crews. Because these ducts can be laid in direct contact with each other, no between-tier backfilling is necessary. This means shallower, narrower trenches and lower excavation costs. Transite's easy-to-install plastic coupling is a real money-saver, too! With a flexibility of 5 degrees, it permits simplified splaying without special fittings. Installation savings of up to 15¢ per foot have been made!



Transite ducts require little, if any, maintenance. The permanently tight joint keeps out water-borne silt and dirt. What's more, it permits pneumatic rodding which can save you 5¢ a foot. No wonder one out of every four feet of telephone duct installed in 1959 was Transite. For further information write Johns-Manville, Box 14 TY-7, New York 16, N. Y. In Canada: Port Credit, Ontario.

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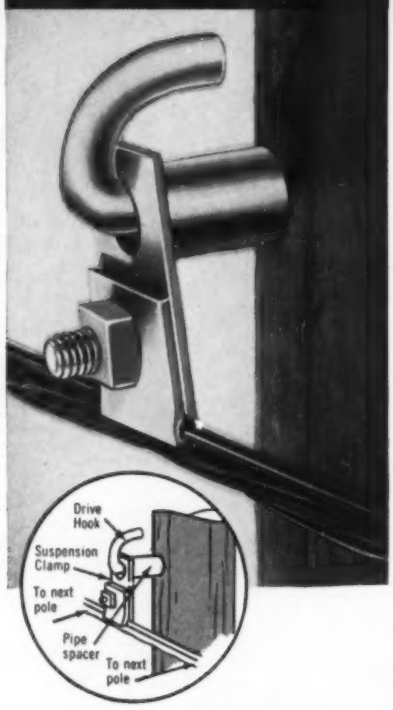

Superior Tangent Supports TS 222 and TS 934, constructed of galvanized steel, provide a low-cost, simple method of supporting I.M. (Integrated Messenger) wire products. TS 222 will support a steel messenger of .062 diameter. TS 934 will accommodate steel messengers of .083, .109 and .134 diameters. Both tangent supports hang on the 7/16" diameter drive hook.

For prices, write

SUPERIOR CABLE

SUPERIOR CABLE CORPORATION
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QUEEN FOR A DAY

Continued from page 21

me one day that an operator was having some difficulty at home, would I talk to her? The girl tearfully told me that she lived alone with her mother and that the day before they had had to pay taxes on their home and this had taken all their money. Their coal bin was empty, she continued, and there was little in the house to eat. She just didn't know what to do.

I told the young lady to dry her tears, that things might not be as bad as they seemed. I asked her how much cash she would need to tide her over until payday. She opined that $50 would take care of their requirements. I told her not to worry, I would have a check for her by the time her trick was over. She could pay it back, a dollar a week or most any way she wished, with no interest. She seemed honestly thankful when I handed her a check that evening. She was clutching the piece of paper tightly and was smiling as she left the office with eager steps. I felt happy, I had done my good deed for the day. The next morning, the young lady appeared at the operators' cloak room all dolled up in a brand new fur coat!

Switchboard-men Tolerated

Switchboard-men were held in antipathy, a condition that had to be tolerated by the operating people. They were considered a necessary evil and accepted as such. Like most telephone men, switchboard-men loved a joke and often a member of the operating force was the target of their piquant mischief.

The night switchboard-men often helped the operators during emergencies. Whenever a fire alarm was turned in during the night, the switchboard would light up like a theatre marquee. Then the switchboard-men would put on headsets and answer the "where's-the-fire" calls. They also assisted the operators with the long lists of early morning calls, requests of customers for an early morning awakening. The sleepy men and women who answered the telephone rarely failed to reward the young men with a "Thank you, 'sweetheart'!"

In the early days of noisy and poorly ventilated operating rooms, it was a rare day that the chief operator didn't call upon the switchboard-men to help carry out a young lady who had swooned at the switchboard. Quite frequently romance stalked the operating room and the friendly switchboard-men took an operator seriously, or vice versa, and wedding bells would harmonize with the jingling of the telephone bells!

Many "Stage-Door Johnnies"

I suppose there are still stage-door Johnnies, young swains, who think the front entrance to a telephone building is the ideal meeting place for a tete-a-tete with an operator. But, sometimes, in the old days, the young Lotharios congregated so thickly on the sidewalks the girls had difficulty making their way through the mob. When the young men became too bold, as they often did, an off-duty policeman would be hired temporarily to patrol the building and keep the "Johnnies" on the move. Should a young man have a legitimate date with an operator, he was invited into the office to wait until his girl friend got off duty.

The hiring of operators today is a far cry from the infant days of telephony. There were no educational requirements. If a girl could write legibly and talk intelligently, she was hired. Little attention was paid to her voice. If she had a strong voice so much the better. Some toll calls demanded a voice with volume to be heard at the other end of the line.

Chief Operator Did Hiring

The chief operator did the hiring. If a girl was recommended by an operator or another employe, well enough, the chief operator put her at the board. The chief operator had the authority to fire a girl, too. Her word was law. She seemed to have an uncanny ability to choose girls who made the best operators. She seldom made a mistake. She frowned on hiring left-handed girls, especially for the A-board where the close proximity to each other made the writing of A-B toll tickets a difficult task for the lefty.

Not too long ago, approved phrases were designed to cover almost any query or condition that might arise. These phrases were repeated so many times they began to sound like a stuck phonograph needle. Customers became exasperated. Funnymen on stage and screen made many jokes of this mechanical way of handling telephone calls. The practice was short lived. Public opinion wrote its obituary. Today operators are encouraged to emphasize the friendly voice and to use phrases of their own, phrases that spell out the glad-to-serve spirit which today makes the telephone operator the most talked about and admired young lady in the business world.

During World War II the telephone operator exemplified her worth, especially to the young men who were in-

ducted into the armed services. She became guardian of the paystation units at induction centers. Here she met desperately homesick men who had never placed a long distance call. There were a few who had never used the telephone. Our little matron of the talking wires gave them solace and helped them in every way she could, which helped to further endear the telephone operator to the American people.

The telephone operator has lived through 80 some years in the history of speech transmission. In many villages and towns, and even in some of the larger cities, her replacement by dial was contested by her customers. In later years, although these subscribers admitted dial service was faster, less faulty and held fewer interruptions, they aver vehemently: "The Voice With a Smile" can never be replaced by the hum of a twirling dial. The little personal courtesies of the telephone operator left their mark on her public. She has been a star performer in the romantic advancement of telephony. She was "Queen For A Day" . . . a long, long day!

NEW DEVELOPMENTS

Continued from page 28

Electric L carrier on an end-to-end basis and complies with CCITT recommendations.

This system — Type 46A — provides up to 600 channels of highest grade toll quality circuits, capable of handling telegraph, facsimile, SAGE and other forms of data for transcontinental transmission.

Equipment dependability is provided through the use of parallel or alternate active circuitry where more than 12 channels are common to a transmission path.

Patch bays have been designed to permit in-service patching of channel banks, group banks, and supergroups with a minimum of circuit disturbance. A series of connector filters, bridging, bracing and blocking facilities will be available to permit system flexibility.

The three-step modulation plan places 600 channels in the line frequency band of 60 to 2540 kc. Each 12-channel group is converted to a basic group band of 60 to 108 kc, with five groups (60 channels) converted to a basic supergroup band of 312 to 552 kc. The third modulation step places nine supergroups in one of 10 supergroup allocations at line frequencies. Supergroup 2 is transmitted direct.

A-m out-of-band signaling at a frequency of 3,825 cycles is available with each channel. Signaling is also available to coordinate with Western Electric Type E single frequency in-band

"Of course I know what the trick is. He's using CF&I Galvanized Strand."

While we can't guarantee that CF&I Galvanized Steel Strand can do the old Indian rope trick, we *do* know that there's no better strand for supporting telephone cables.

As a result of some modern engineering and production techniques, CF&I Galvanized Steel Strand offers you a unique combination of strength, flexibility and corrosion-resistance. The end-result is a messenger strand that is easy to install, provides years of trouble-free service and cuts maintenance costs.

Made in 7- and 3-wire constructions, CF&I Galvanized Steel Strand meets ASTM specification A-122. Or, it can be tailor-made to your particular requirements. Call your nearby CF&I sales office or distributor for complete details on CF&I Galvanized Steel Strand, Telephone Line Wire and Tie Wire. 6233

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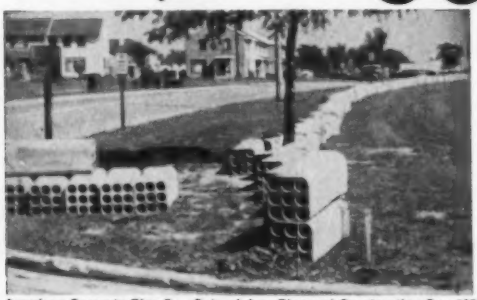

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signaling for end-to-end operation with Western Electric terminals.

Group pilots at 92 kc and synchronizing pilots at 64 or 308 kc are provided to coordinate with "L" carrier. For CCITT operation, a group pilot at 84.080 kc and synchronizing pilot at 60 kc are provided. For operation with Lenkurt 45BX carrier and for dropping lower-frequency supergroups, a synchronizing pilot is provided at 564 kc.

Major and minor alarm indications are provided on all carrier supply units and line amplifiers for systems above 120 channels. A minor alarm operates on failure of an alternate unit or when equipment transfer occurs. A major alarm operates upon an active circuit failure disabling more than 12 channels.

Power equipment is available for operating from ac mains or from 48-volt office battery. DC to dc converters may be supplied for operation from 24-volt battery. Power consumption for a complete 600 channel terminal is about 1500 watts while a 120-channel terminal consumes about 300 watts.

The Type 46-A equipment mounts on standard 19-inch channel or duct type racks. The equipment projects approximately 5 inches from the rack face, with a 10-inch over-all depth. Space and economy advantages are attained through the use of card-type construction. Up to 120 channels (10 channel banks) may be mounted on a single bay, with all cabling and maintenance performed from the front of the equipment. A complete 600-channel terminal, including spare equipment, can be mounted in as few as 12 bays.

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Subscriber Carrier System. ***(Fig. 6).*** Panhandle Electric Sales, Inc. recently announced its Urban "X" cable sub-

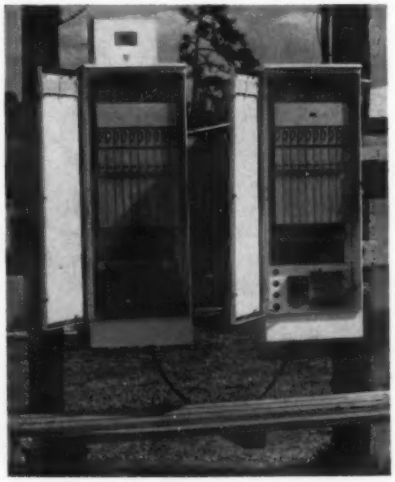

Fig. 6. Subscriber carrier system.

scriber carrier system for meeting service demands in fast growing urban areas. This system is the subscriber version of the Type "X" carrier system and, like it, is arranged on a four-wire, 10-channel basis. Available in a complete range of subscriber signaling options, this system is compatible with standard "X" equipment which might be located at the central office.

Urban "X" equipment is of completely modular construction, and all circuitry is completely transistorized. Subscriber equipment may be located in pole-mounted weatherproof housings or in prefabricated steel huts. Standby power is available for either type of subscriber location.

The repeater design employed in this system takes full advantage of the characteristics of angular modulation, eliminating the need for compandors and pilot regulation. The repeater system operates on a four-wire basis with each repeater having a maximum gain of 20 db at 33 kc with facilities for slope and warp adjustments. Repeater systems having an over-all loss of 240 db and 12 repeater locations can be accommodated regardless of cable gauge. The repeater power is simplex fed over the cable pairs from each end of the system. A voltage doubler arrangement, employed in the transistorized circuitry of the power and carrier feed unit, supplies filtered and regulated power. The power and carrier feed unit is strapped for output voltages of 90, 135 or 180 volts, depending on voltage drop encountered in cable and repeaters. This circuit advancement permits repeaters to be fed from readily available 48-volt dc supplies, assuring power reliability.

A 20-channel terminal occupies 57¾ inches of rack space. In systems employing master oscillators, 7 inches are required for its mounting. A total of 80 channels can be mounted on a standard 11 foot, 6 inch by 19 inch relay rack on a front and back basis.

The use of a universal equipment panel with installation hinges and front-mounted plug-in modules simplifies installation. The only wiring required for installation is the power from a 48-volt source, drop pairs and transmit and receive pairs. These are all wired on the back side of the mounting plate.

The Panhandle company states that one of the prime objectives in the design of the "X" system was ease and simplicity in lineup. The channel lineup testset makes all readings necessary to line up channels and office plug-in units. The repeater testset indicates the proper strapping on repeater units in a matter of three readings. The channel units are equipped with standard test jacks

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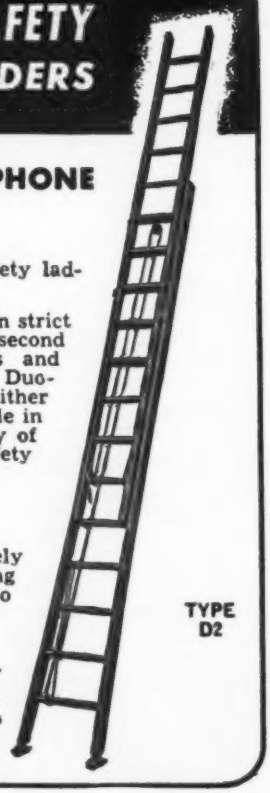

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permitting the use of a switchroom test telephone set. This permits channel usage checks as with physical trunks or switches.

(To Be Continued)

Southwestern Bell Announces Changes in Texas

Budd Reinhold has been named to the new position of general manager in the North Texas area of Southwestern Bell Telephone Co.

In another appointment to a new position, P. G. Willbanks has been promoted from general traffic manager for North Texas to assistant vice president-staff for Texas.

They will report to Richard A. Goodson, vice president and general manager for Texas.

Norman Gessley, general plant manager for the company's South Texas area, will succeed Mr. Reinhold as assistant vice president-operations at headquarters in St. Louis.

Joe H. Hunt, assistant vice president for training and employment, has been promoted to general plant manager in South Texas.

Paul P. Cheatham has been named general traffic manager for North Texas. He is division traffic superintendant at Houston and will be succeeded in this job by Frank L. Pyle, South Texas traffic supervisor.

Remember—to Think

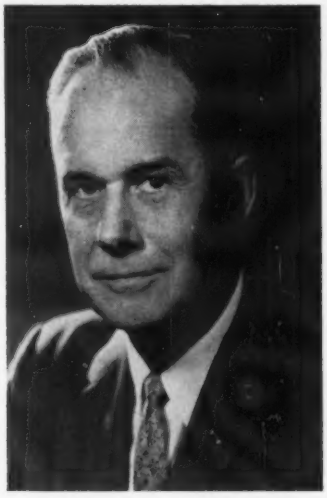
"The secret of a good memory is attention, and attention to a subject depends upon our interest in it. — We rarely forget that which has made a deep impression on our minds."—TRYON EDWARDS.

Favorable Climate

"In our free economy, economic growth and the improvement of living standards depend not primarily on what government does, but mainly on what is done by individuals and groups acting in their private capacities. Government makes its basic economic contribution not through the volume of its own expenditures, but by promoting conditions favorable to the exercise of individual initiative and private effort. Accordingly, a dominant purpose of government at every level must be the preservation and invigoration of institutions that favor and support enterprise."—*Dwight D. Eisenhower, former President of the United States.*

Lt. Gen. C. E. Byers Heads D. C. Office GT&E Corp.

Lt. Gen. Clovis E. Byers, U. S. Army (Retired), has been named vice president-Washington, D. C., office for General Telephone & Electronics Corp., according to Donald C. Power, GT&E chairman and chief executive officer, to whom General Byers will report.



LT. GEN. C. E. BYERS

General Byers will be responsible for coordination of the relationships between the over-all General Telephone & Electronics organization, including the parent company and the subsidiaries, and the various branches and agencies of the federal government in Washington. He succeeds Rear Adm. Frederick J. Bell, U. S. Navy (Retired), who has resigned, but who will continue as a consultant to the company.

General Byers was graduated from the United States Military Academy at West Point, N. Y., in 1920 with the degree of bachelor of science, and was commissioned a second lieutenant. During the years intervening between graduation and World War II, he held a number of command and staff assignments and also spent two periods as an instructor at the United States Military Academy.

During his last 17 years of active duty, he spent nearly 12 years in overseas assignments. They included, during World War II, combat assignments as Chief of Staff I Corps, Commanding General 32nd Division and Chief of Staff Eighth Army. During the Korean fighting, he was Commanding General of X Corps, during the successful fighting at Bloody and Heartbreak Ridges. He later commanded the XVI Corps.

General Byers' peacetime assignments have included:

Commanding General 82nd Airborne Division; and a two-year tour in Wash-

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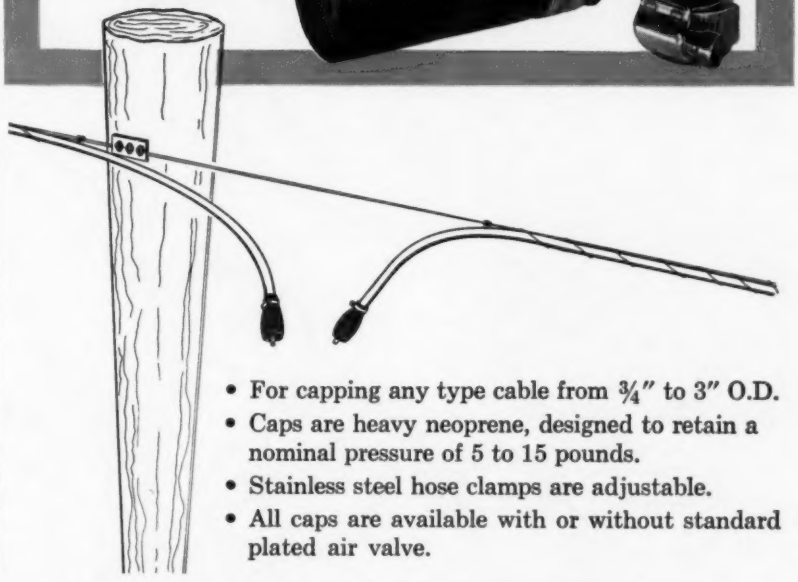

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ington as Deputy Chief of Personnel, United States Army, after which he went to Korea.

After Korea there followed a tour as Chief of Staff, Allied Forces Southern Europe with headquarters in Naples, Italy.

He returned to the United States to be Deputy Commandant of the National War College.

Next came another European assignment as Commandant, NATO Defense College in Paris, France.

His last active duty assignment was as Military Advisor to the Assistant Secretary of Defense (International Security Affairs).

He retired on May 31, 1959, after 40 years' service; and in January 1960, became the executive vice president of the Council for Economic Growth & Security, Inc., New York City.

During his military career, he attended the Cavalry School, the Signal School, the Infantry School, the Command and General Staff College, the Army War College and the National War College.

General Byers has received these decorations: Distinguished Service Cross; Distinguished Service Medal, with oak leaf cluster; Silver Star, with oak leaf cluster; Legion of Merit, with oak leaf cluster; Bronze Star, with two oak leaf clusters; Air Medal; Purple Heart and two Presidential Citations.

He also holds the Korean Presidential Unit Citation.

His foreign decorations include: Commander of the Military Division of the Order of the British Empire; Officer, French Legion of Honor; from Greece, the Grand Cross of King George I; Commendatore of the Order of the Italian Republic; Military Merit Medal of the Philippine Republic; from Belgium, Grand Officer of the Order of Leopold II with Palm and the Croix de Guerre 1940 with Palm.

GSA Rapped for Activities Before Federal Commissions

The Chamber of Commerce of the United States has stated that the federal government's General Services Administration (GSA) duplicates the work of federal regulatory bodies, delays their decisions, and at times has urged them to depart from statutes.

Congress was asked to cut GSA's budget for transportation and public utilities service and, also, to admonish GSA on its participation in cases before regulatory agencies.

Views of the national chamber were contained in testimony delivered before a Senate Appropriations Sub-committee. Sam H. Flint, general traffic manager of The Quaker Oats Co., Chicago, testified for the chamber.

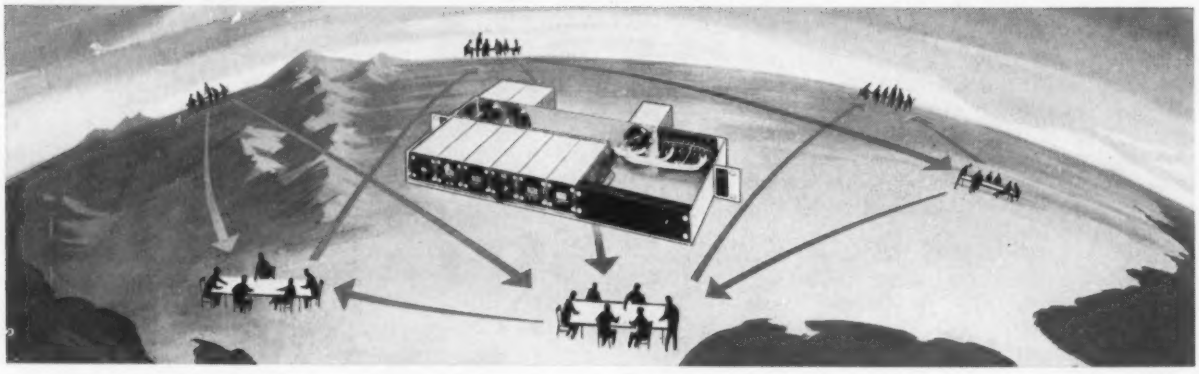
In rate-making cases, responsibility for protecting the public and the federal government rests with federal and state regulatory bodies, Mr. Flint said. GSA, he said, should "restrict its studies to the fairness and reasonableness of rates charged for government shipments and utility services as compared with those of other shippers and users."

In evaluating "over-all earnings, property used by the companies, and their operating expenses," Mr. Flint said, GSA "is duplicating the work of commission staffs."

". . . records are available to prove that GSA has urged regulatory commissions to depart from the established regulatory policies of the commission," Mr. Flint said, "that it has even urged a commission to depart from statutory instructions as to the valuation of a utility's rate base."

GSA has contributed to the problem of delay of decisions, Mr. Flint said. GSA "invariably opposes rate increases even if all other factors indicate strong

NEW...ALTEC LOUDSPEAKING TELEPHONE SYSTEM FOR INTER-OFFICE TELEPHONE CONFERENCES COAST-TO-COAST



Now, Derive Unlimited Extra Revenues from Existing Lines with This Important Advance in Telephone Service!

Coast-to-Coast inter-office telephone conferences with many talkers at each location are now possible with the new ALTEC 7302 Loudspeaking Telephone System. The 7302 is a fully transistorized system that maintains uniform talking and listening levels regardless of distance with speech transmission of such great fidelity that familiar voices are recognizable instantly. With an effective audio coverage of a large size executive office, the system offers freedom of movement and comfortable hands-free operation to large groups of talkers.

The 7302 operates on *existing telephone lines* in conjunction with type 510 set or equivalent. Associated ALTEC equipment includes the 755C Loudspeaker and one of the following ALTEC Cardioid Microphones: Models M-30, 683A, or 685A. The 7302 mounts in standard 19" relay rack and occupies only 1¾" rack height. Power is supplied to the system from central office or PBX quiet battery supply of 24-26 v DC.

This system—now in use by a nation-wide retailer and a drug chain—provides the answer to their needs for instant consultation among their executives at branch offices throughout the country. With this system, you can now fill the many requests for this type of service from brokerage houses, military command facilities, and any organizations requiring group discussion of problems among specialists in separate locations. For complete information write Dept. T-A7.

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justification. Its presentations are usually voluminous and its argument extensive."

Delay of six months or a year can cause losses "which are rarely recovered by the companies involved," Mr. Flint said.

General of Ohio Men Receive LaCroix Heroism Awards

An overturned car in a lake with five youths trapped in it, and a motorist bleeding profusely on a highway in near-zero weather were the scenes confronted by two General Telephone Co. of Ohio employes on separate occasions last year. Probably, because of their quick actions, six lives were saved. The two General System men received LaCroix awards for their acts on June 23.

Willard Jenkins of Celina, a cable splicer, and Charles R. Saffell of Marion, a supervisor, received the General System awards from Clare E. Williams of Marion, president.

Mr. Jenkins earned General's LaCroix Bronze Medal and $250 for rescuing five Indiana young men last August. He is the first General of Ohio employe to win such an honor.

The award for Mr. Jenkins was his second major one this year. In April he won the Ohio Independent Telephone Association's "Beyond the Call" award for saving the Indiana youths.

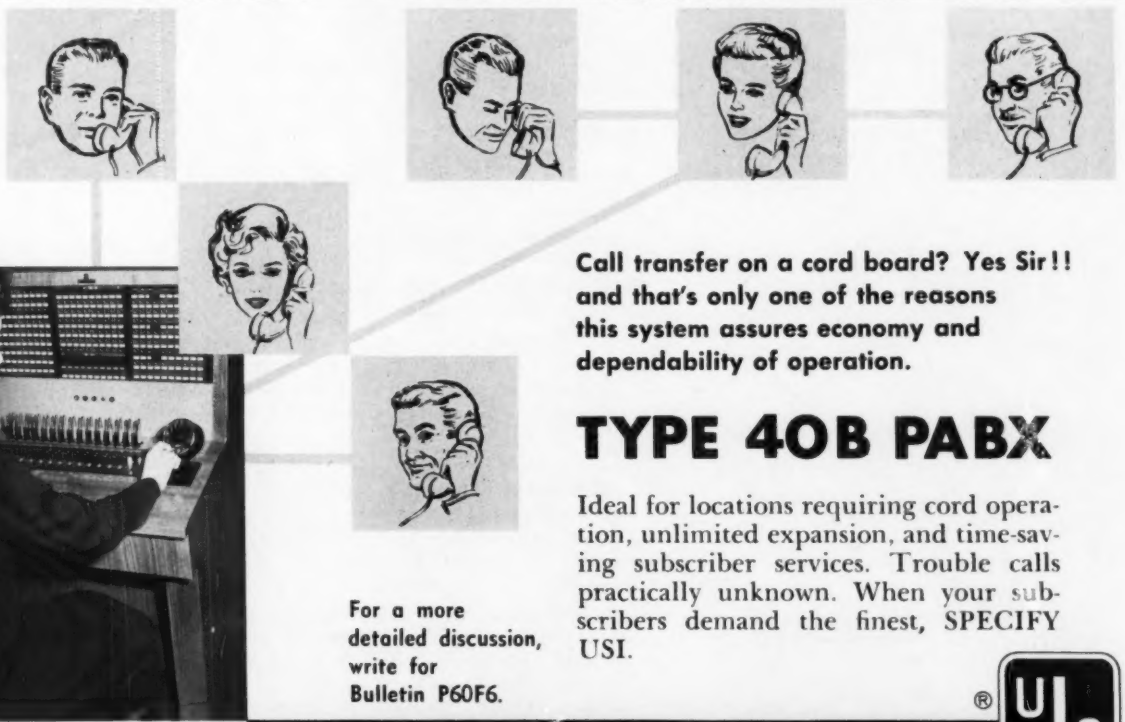
Credited with saving six lives in heroic acts, Willard Jenkins of Celina, O., a cable splicer (left), and Charles R. Saffell of Marion, O., a supervisor (right), on June 23, received LaCroix awards from Clare E. Williams of Marion, president of General Telephone Co. of Ohio.

This heroic deed occurred when he and an unidentified man pulled the youths from their car, which had struck a bridge and plunged into Lake St. Marys, near Celina, upside down with only its wheels protruding.

Mr. Jenkins dived from the 12-foot-high bridge into the water and extricated the youths one by one. The youths sustained minor injuries.

Mr. Saffell, who was credited with saving the life of a traffic victim last December, received the LaCroix Certificate of Meritorious Service.

Mr. Saffell's deed occurred near Delaware, O., on Route 23, when he applied a makeshift compress on the neck of a traffic victim. A doctor later remarked that his aid prevented the victim from bleeding to death.



Call transfer on a cord board? Yes Sir!! and that's only one of the reasons this system assures economy and dependability of operation.

TYPE 40B PABX

Ideal for locations requiring cord operation, unlimited expansion, and time-saving subscriber services. Trouble calls practically unknown. When your subscribers demand the finest, SPECIFY USI.

For a more detailed discussion, write for Bulletin P60F6.

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UNITED STATES INSTRUMENT CORPORATION
CHARLOTTESVILLE, VIRGINIA

USI® CORP.

No more stopping to clear chips

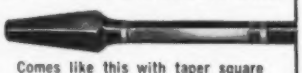
New Irwin Pole-Bor Bits save time . . . money

Now get easier, faster, non-stop boring action in telephone and power poles. Irwin Pole-Bor bits give continuous chip flow—even in creosoted wood. Special Irwin cutting head, twist angle, and smooth-polished hollows eliminate clogging and binding. Side lip smooths hole for easier insertion of bolts and pins. Heat tempering full length gives extra strength, more safety for the man on the pole.

3 Lengths — 12 Sizes

New Irwin Pole-Bor bits come in 12″, 18″ and 24″ lengths, with 8″, 12″ and 18″ twists. Sizes range from $^{9}/_{16}$″ to $^{17}/_{16}$″. Use these new Irwin bits for just about any job — whether boring crossarms, small, medium or extra large poles, heavy timbers. And remember: Irwin's patented Adapter Shank fits both hand braces and electric drills. Save time and money. Use fewer bits on the job. Get Irwin Pole-Bor non-stop boring action and extra safety, too. Order from your Irwin distributor today. The Irwin Auger Bit Company, Wilmington, Ohio.

Irwin Adapter Shank fits both hand braces and electric drills



Comes like this with taper square shank for use in hand braces.

Cut off taper square shank. Use in both hand braces and electric drills. No wobble, no run-out.

IRWIN Pole-Bor Bits

World Telephone News: UN, GB, Iron Curtain

Two telecommunications projects were covered in the funds recently allocated by the Governing Council of the United Nations Special Fund for economic development.

A special fund allocation of $896,100 was made to the Federation of Malaya to establish a telecommunications training center at Kuala Lumpur. The Malayan government contributed $2,431,500 toward the project.

The center will be set up with the aid of the International Telecommunication Union (ITU).

It will provide specialized training courses of one to 24 months for technicians and engineers.

The Malayan government estimates that there may be 500 trainees at the beginning of the five-year project, increasing to 700 towards its end.

In the other allocation, a telecommunications training institute will be established at Manila, Republic of the Philippines.

The special fund approved $968,600 towards this center, with the Philippine government contributing $662,700.

The ITU also serves as executor of this project.

Of the 1,360 communities scattered over the 7,000 islands of the Republic of the Philippines, 281 have no telecommunications and existing stations are greatly understaffed.

The institute in Manila, will, for the five-year duration of the project, provide training for 650 engineers and technicians. After that, about 110 persons will be trained annually.

•

Turning to telephone developments in other parts of the world, telephone calls on the authority of a British Post Office "Credit Card" can now be made from the Bahamas, Formosa, and Uruguay.

Charges can be transferred in both directions in the service with the Bahamas.

The credit privilege is available on incoming calls from Formosa and Uruguay.

•

Behind the Iron Curtain, Mashpriborintorg of Russia has placed a contract with Automatic Telephone & Electric Co. of Great Britain for 3,366 British Pounds worth of communications equipment (equivalent to approximately $9,475.29). The order was placed during the British Trade Fair which was held in Moscow.

•

From Hungary comes news that the Beloiannis Telecommunications Equipment Works (BHG) increased its exports 150 per cent between 1950 and 1956 and 195 per cent between 1957 and 1960. The Hungarian company has supplied telephone equipment to 25 countries.

Unkindest Cut of All

"Most people pay their federal income taxes via the withholding system. The employer keeps back a certain percentage of the paycheck and turns it over to the government.

"Many workers don't have any accurate idea of just how much is deducted, so some concerns have adopted novel ways of driving the lesson home.

"One, for instance, set up two adjoining pay windows. At the first, each employe was given his full check, without deductions. But he had to go at once to the second window and shell out his tax for that pay period.

"Another used a different means of achieving the same purpose. An employe, whose pay was $100 a week, was given the full amount, without any deductions, for three weeks. But at the end of the fourth week, the pay envelope held a paltry $23.60. When he screamed in protest, the tax story was explained to him. His four-week bill was $76.40, and the company had taken it all in one big bite, instead of four smaller ones.

"A publication of the Florida Power & Light Co., after telling of these two devices to make employes more tax conscious, observes: 'Employes who suddenly have been jolted by the size of the tax bite, usually develop a less complacent viewpoint. They see the connection between high federal spending and the lump of tax money chopped from their paychecks. . . .'

"The country needs more of that kind of jolting of the taxpayers."— *Industrial News Review.*

Stromberg Announces Larson, Bailey Appointments

Ernest D. Larson has been appointed to new responsibilities as a field engineer for the Stromberg-Carlson Credit Corp., according to Charles W. Pritchard, president. Mr. Larson will assist Independent telephone companies in

E. D. LARSON

planning and carrying forward their modernization programs. His work will parallel that of Mark Maurer.

Mr. Larson has been succeeded by S. W. Bailey as a sales representative for Stromberg-Carlson telecommunication products in western Oregon, Wash-

S. W. BAILEY

ington, and Alaska, T. C. Thompson, general manager of commercial sales, states.

Mr. Larson's telephone experience has included extensive work in installation and sales, first with Western Electric, and later with General Dynamics. He worked on the installation of a

CORD OF DIRECTORS
It's Spiraflex®—the remarkable retractile from Commercial Cord. Spiraflex has b-i-g stretch, instant snap-back... gives noise-free long-life service. ■ Get Spiraflex in standard, 9, 15 or 25-foot lengths...jacketed with rugged PVC, in black or choice of colors. ■ Commercial Cord makes everything you need in phone, intercom, patch and related cords — straight and Spiraflex. ■ Get catalog, samples, prices from Commercial Cord Co., Clifton Springs, New York. Distributed by: Leich Sales Corporation, 427 W. Randolph Street, Chicago 6, Illinois; Automatic Electric Sales Corporation, Northlake, Illinois.
COMMERCIAL CORD

New techniques in COMMUNICATIONS

Gustav Hirsch Organization, Inc., offers the most comprehensive program in the communications industry — skilled engineering, quality construction and many special services.

GHO projects include toll dialing, microwave circuiting and automatic switching. For expansion or an entirely new system, GHO is ready to serve you.

number of large "XY" central offices, including the 2,500-line office in Junction City, Kan. As a sales representative, he served the West Coast Independents.

A native of Nebraska, Mr. Larson served in the Army Air Corps in World War II.

Mr. Bailey has traveled the western states as a sales representative since 1956, and most recently, in Montana, Utah, Idaho, eastern Oregon and eastern Washington.

Prior to that, he gained experience as a plant supervisor for the Farmers Mutual Telephone Co. of Lynden, Wash.

He attended Alaska University, and his first position in telephony was with Ketchikan Public Utilities, where he worked as an installer, lineman, and central office equipment engineer.

He also served as an electrician's mate, first class, with the U. S. Coast Guard in Alaskan waters.

Koiled Kords Holds Meeting To Discuss Color Matching

A recent meeting of telephone industry executives held by Koiled Kords, Inc., at New Haven, Conn., heard a report on methods of assuring the correct color matching of telephone cords and sets.

Since the introduction of colored telephones, Koiled Kords, Inc., according to John Brown Cook, president, has sought the solution to the color matching problems facing the telephone industry. An essential part of this problem, according to Mr. Cook, is that visual inspection is not a consistently reliable method. It is a subjective measurement affected by such things as light source and individual reactions, with no way either to establish or to meet close tolerances.

Koiled Kords, Inc., reported that it hired the Arthur D. Little Co. to make a complete study of the situation and to recommend ways of measuring and controlling color. As a result, Koiled Kords states that it has now established a program using scientific methods for objective measurement of the color and brightness of the set and the cord compound that will correlate with visual inspection. This, the company claims, will enable them to meet manufacturers' specifications within predetermined and measurable tolerances.

McGowan, Garrison to Union Carbide North Central Area

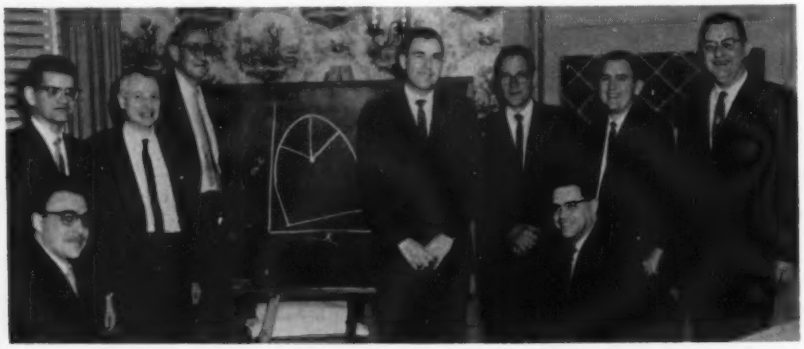
Harry J. McGowan has been assigned as a special sales representative in the North Central sales region of Union Carbide Plastics Co., and Richard L. Garrison has been appointed assistant regional manager in the same sales region, according to announcement by J. M. Herbert, regional sales manager.

Mr. McGowan will continue to service selected automotive accounts. He will also handle special molding and extrusion accounts, concerned primarily with automotive applications involving Bakelite polyethylene, vinyl, phenolic, styrene, and epoxy resins, and compounds.

He will continue to work out of the company's district sales office at 10421 West Seven Mile Road, Detroit 21, Mich. (DIamond 1-3131).

Mr. McGowan attended Notre Dame University, and was graduated from the University of Pittsburgh in 1934.

Following graduation, he joined Union



A recent meeting sponsored by Koiled Kords, Inc. heard a report on assuring correct color matching of telephone cords and sets. Telephone industry executives present were (seated at left): Amedio D. Petrangelo, telephone engineer, General Dynamics/Electronics. Standing left to right: Harold Baker, GD/E; Orville Smith, chemical engineer, Automatic Electric Co.; Richard Gross, Arthur D. Little Co. engineer who headed the color matching project; Walter Pennington, quality control manager, ITT-Kellogg; Robert Hillman, chemical engineer, Whitney Blake Co.; John Dalton, product engineer, ITT-Kellogg; Ray Dudley, chief chemist, Whitney Blake Co.; John Wolff, standards engineer, Whitney Blake Co. (seated).

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by Sumitomo

For Reliable and Lifetime Service

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- Fully Color Corded
- For Aerial and Direct Use to REA Spec PE-22
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- Available in No 19, 22, 24, 26 Gauge

STALPETH
- Layer and Unit Type
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- Following Constructions Available:

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No 22 AWG up to 909 p
No 24 AWG up to 1515 p
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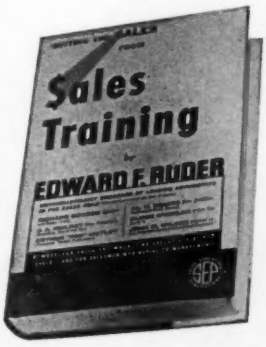
Cable Address: SUMITELIN OSAKA, SUMITELIN TOKYO.

NEW TRAINING BOOK RECOMMENDED BY TELEPHONY

Here is a much-needed book on sales training for use by managers, department heads, superintendents, trainers, schools and libraries.



The newest training techniques are given practical application. Included are indoctrination, refresher and by mail training; memory, reading and speech improvement; and training supplements—sales contests, meetings, manuals, house organs, and new recruiting and hiring methods. This new book is enthusiastically endorsed by the top authorities—Arthur Motley, Pres., *Parade Publications;* Al Seares, V.P., Remington Rand; Elmer Wheeler, Consultant; John Wilson, Retired V.P. Sales, National Cash Register; J. McInay, V.P., Marketing, Ray-O-Vac; Richard Borden, Consultant.

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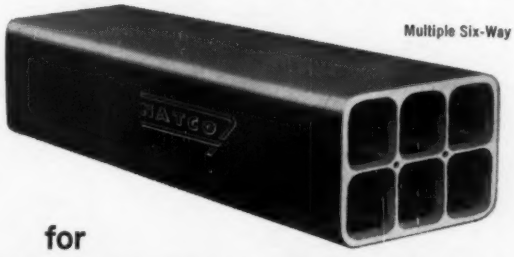

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PERMANENT PROTECTION OF UNDERGROUND CABLE

Natco Clay Conduit is furnished in both single and multiple duct for the permanent protection of underground telephone, telegraph, signal, power and lighting cables against fire, corrosion, electrolysis, mechanical injury and chemical attack. Write for catalog.

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SINGLES TWO-WAY THREE-WAY FOUR-WAY NINE-WAY

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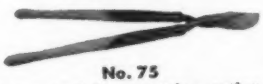
No. 11
Cuts up to 1" branches. A strong, durable, easy cutting 18 foot tree pruning unit. Spruce extension poles in 6 foot sections, with telescoping aluminum joints.

No. 12
Cuts up to 1½" branches. Pruner head is malleable iron casting, husky, unbreakable. Smooth, easy cutting action.

LOPPING SHEARS

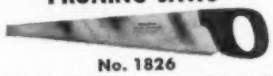
Heavy duty, fast easy cutting loppers designed for utility use.



No. 75
Compound lever cutting action, smoothly slices through 1¾" to 2" branches.

Nos. 525, 530
The famous "Tiffany" pattern lopping shears 25" and 30" models. Cut branches up to 1¾".

PRUNING SAWS



No. 1826
26" blade of Sandvik Swedish steel especially designed for true work. For these spots where a chain saw can't operate.

Send for literature and additional information on pruning tools of all types.

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Since 1850

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Oakville, Connecticut, U. S. A.

Sales Representative
JOHN H. GRAHAM & CO. INC.
105 Duane Street, New York 8, New York

Carbide Plastics, and for a number of years, serviced molding and extrusion customers in the North Central sales region.

Recently, he has served as a development engineer on special automotive applications.

Mr. Garrison will supervise the sales activities of Bakelite polyethylene, phenolic, epoxy, styrene, and vinyl resins and compounds for all applications in the Michigan peninsula and northwestern Ohio areas. He will be located in the Detroit office.

He was graduated from Trinity College with a bachelor of arts degree, and from Harvard University, where he earned a master of business administration degree in 1953. Mr. Garrison served as an Air Intelligence Officer with the United States Naval Air Corps for three years.

He joined Union Carbide Plastics Co. in 1956, and after completing the extensive sales training program at Bound Brook, N. J., served as a technical sales representative in the midwest.

Kearney, Hubbard Announce Executive Changes

The James R. Kearney Corp. of St. Louis, and Hubbard & Co. of Chicago jointly announce the election of Charles P. Wenner as chairman of the board of directors of both companies.

Presently, Mr. Wenner is president of Kearney and a director of Hubbard. He will replace Franklin H. Kissner,

C. P. WENNER

former chairman of both companies, who has resigned but who will remain a director of both companies.

John R. Morrill was elected president of James R. Kearney Corp. at a meeting of the board of directors on June 27. Mr. Morrill will continue as

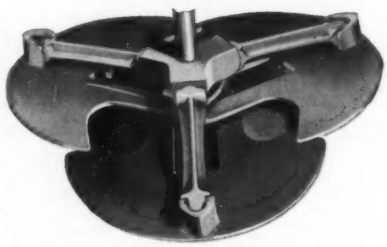
J. R. MORRILL

president of Hubbard & Co. in addition to his new duties.

Both the James R. Kearney Corp. and Hubbard & Co. are affiliated through the Dyson interests in New York.

The directors of Kearney and Hubbard in announcing these changes stated, "Both James R. Kearney Corp. and Hubbard & Co. have interests that are closely allied. In the past two years cooperative programs in engineering

EXTRA Holding Power
QUICKLY Installed
TOUGH For long life



EVERSTICK ANCHORS

For new construction and maintenance —Everstick Anchors speed up work and provide dependable anchorage on all types of jobs. Made of resilient, rust resistant malleable iron. The toughest anchors made. Write for bulletin.

EVERSTICK ANCHOR CO.
FAIRFIELD, IOWA

and manufacturing have proved to be very worthwhile.

"The future planning and organizing of further programs of cooperation is the primary assignment of Board Chairman Charles P. Wenner, who brings to his position a lifetime of experience in the electrical industry. Mr. Morrill will serve as the operating head of both companies."

Mr. Wenner started his career in the electrical industry with Central Illinois Public Service. Thirty-two years ago he joined Kearney in the sales department. After various assignments he was made president of James R. Kearney Corp. of Canada in Guelph, Ontario. In 1959 he became president of Kearney.

John R. Morrill was general manager of the Evansville, Ind., operation of Bendix-Westinghouse Automotive Air Brake Co. prior to joining Hubbard in 1959.

ITT Group Furnishes UK Teleprinter Network

A teleprinter communications network linking the North American offices of Aluminium Limited of Canada (Alcan) at Montreal, with all of the company's installations in the United Kingdom, was cut over to operation on June 26.

The private-wire system, which utilizes the transatlantic cable, was engineered and supplied by Creed & Co. of Croydon, England, an International Telephone & Telegraph Corp. affiliate. Other ITT companies in Europe are working with Alcan in planning installations throughout the continent that will eventually hook-up with the main London switching center and with the North American complex.

An important feature of the system, which will handle several thousand business messages a week, is the high degree of automatic operation engineered into the equipment. This is made possible by the use of punched paper-tape in conjunction with special electronic switching units and tape relay devices.

In a typical situation, a typist at Alcan's Montreal office would produce a perforated tape record of the message to be transmitted. A short series of pre-determined code numbers or symbols preceding the message indicate the destination or several destinations of the communication. The completed tape is inserted into a transmitter, and the code is read by the switching unit which automatically routes the message to the London switching center. This central point serves six group areas which in turn provide links to outlying Alcan installations throughout Britain.

At the London central switching ter-

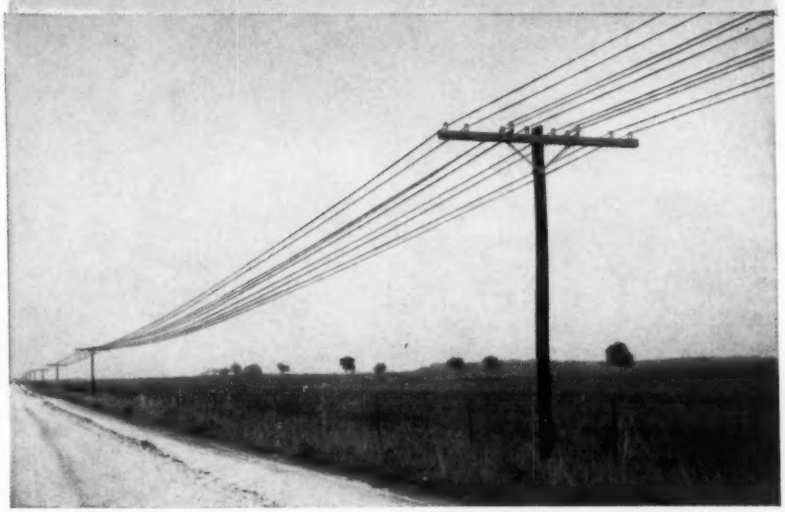
Crapo HTL-135

High Tensile Line Wire

MADE TO WITHSTAND HEAVY STORM LOADS

Time and time again, *Crapo* HTL-135 has demonstrated its ability to stand up under heavy ice and wind loads when other conductors failed. This can be attributed to the fact that *Crapo* HTL-135 combines high strength with high fatigue endurance plus superior elastic qualities which enable it to spring back into place when loads are removed. The result: service interruptions are minimized, re-sagging is seldom necessary, where this rugged telephone wire is used.

The excellent telephonic transmission characteristics of *Crapo* HTL-135 make practical subscriber loops of 14 to 15 miles with normal voltages and equipment. Longer loops are possible where higher voltages and more sensitive telephone sets are employed. For dependable, long-span, low cost rural lines, specify *Crapo* HTL-135.



HERE'S PROOF OF DEPENDABILITY

The **Crapo** HTL-135 in this typical rural line of 300-foot spans was subjected to two heavy ice storms within 14 months. This photo shows the line, without resagging, three months after the second storm.

Write for Manual TM-59 containing complete engineering data!

Crapo HTL-135

INDIANA STEEL & WIRE CO., INC.
Muncie, Indiana

MIDWEC BUILDING-OUT CAPACITOR STUB TYPE B

Designed exclusively for the telephone industry—used and approved by leading telephone companies.

Potting Material—Filled Epoxy Resin and Galvanized Iron Interior Shield.
Cable Type—Standard Lead
Optional, Polythylene
Cable Conductor—22 Gauge
Over-all Length Cable—12' Standard or to Customer Specification
Capacitance Tolerance—±5% Standard, Other Tolerances Available on Request
All Capacitance Values Available to 4th Decimal, from .001 to .100.
Building-out capacitor stubs should be ordered on Supplies Requisition as follows: "MIDWEC Stub, Building-Out Capacitor, ____pairs equipped, ____feet of cable, ____mfd. capacitors, ____tolerance."

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SALES OFFICE:
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New "Lightweight"
PULLS ANY SIZE POLE EASIER!

Simplex ALUMINUM POLE JACK A-1538

35 LBS. LIGHTER — WEIGHS ONLY 60 LBS.

The first time and labor saving improvement in pole jacking in 25 years! Aluminum housing saves 35 lbs. without sacrifice of strength or capacity. Pulls or straightens poles—pulls butts—moves loaded poles...without digging. Husky—to handle the toughest jobs. Same construction features as famous SIMPLEX No. 329 — the standard pole jack of the Bell Systems.

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22-IN. LIFT

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2557 GARDNER ROAD BROADVIEW, ILLINOIS

minal a teleprinter produces a "plain language" copy and a punched tape reproduction of the message. An operator inserts the perforated tape in a local transmitter and the message is sped to the ultimate destination, at a rate of 66 words a minute. A similar routine is followed for messages originating in the British offices, whether destined for North America or other stations in England.

All phases of the engineering program have been designed to allow for the ultimate expansion of the system to Europe, providing almost-instantaneous inter-office communication for every Aluminium Limited installation on this continent and in Europe.

Koch Named Vice President, Secretary of Comptometer

Raymond F. Koch has been elected vice president of Comptometer Corp., Chicago, Lloyd Drexler, vice chairman of the board, and chief executive officer, reports.

R. F. KOCH

Mr. Koch has been secretary of the corporation since 1957, and will hold the title of vice president and secretary, Mr. Drexler said.

He joined Comptometer in 1946 as an apprentice toolmaker, was appointed assistant to the president in 1950, and became assistant secretary of the company in 1954.

Mr. Koch, who received a B.S. degree in business and engineering administration from M.I.T. in 1941, entered the Army in that year as a second lieutenant and was separated as a major in 1946. He was graduated from the Army's command and general staff school at Ft. Leavenworth, Kan., and served 15 months in the Southwest Pacific area.

Lynch Names Garzoli Head of New Department

Fluvio F. Garzoli has been appointed head of the new product and modification engineering section at Lynch Communication Systems Inc.

In making the announcement, D. E. Campbell, president, said the function

F. F. GARZOLI

of the new department is twofold — product engineering to insure the quality of the equipment Lynch produces and modification engineering to make necessary changes so that Lynch equipment can be used in unusual communication system arrangements.

G. J. SMYRNOS

A member of Lynch's engineering staff since 1955, Mr. Garzoli, at the time of his new appointment, was a senior project engineer.

He received his BSEE degree from Stanford University in 1951 and an AA degree from Santa Rosa Junior College in 1958. Before joining Lynch

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Dial Haven Reconditioning Service provides expert workmanship plus genuine and improved parts to insure long life for your telephone dials.

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"AT TIMBER TREATING PLANTS"

Of poles, crossarms, and preservative treatments. Analysis of wood preservatives. Consultation and specification writing.

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Inspectors stationed throughout the U.S.A.

CREO & PENTA TREATED **POLES**

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DIERKS FORESTS, INC.

NA 3-7766 — Hot Springs, Ark.

POLES

B. J. Carney & Co., 100 N. 7th St., Minneapolis, Minn.—Western red cedar poles. Pentrex Butt Treated or Plain.

Cascade Pole Co., P.O. Box 743, Tacoma, Wash. — Creosoted Douglas Fir and Cedar Poles.

C. M. Christiansen Co. — Northern White Cedar Poles, Pentachlorophenol treated. Plant and Yards, Phelps, Wis.

Eppinger & Russell Co., 80—8th Avenue, New York 11, N. Y.—Creosoted Poles and Cross Arms. Plants: Jacksonville, Fla., Norfolk, Va., Eddington, Pa.

International Creosoting and Construction Co., Galveston, Texas.—Creosoted Southern Yellow Pine Poles. Plants Beaumont and Texarkana, Texas.

International Paper Co., Wood Preserving Division — 926 Grand Avenue, Kansas City, Missouri—"LONG-BELL" pressure-treated Southern Pine and Douglas Fir Poles—Creosote or Penta.

Piedmont Wood Preserving Company —Creosoted and Creosote-Penta Treated Pine Poles. Plant, Augusta, Georgia. Yards, Virginia, West Virginia and Connecticut. Address inquiries to Box 1662, Spartanburg, S. C.

Texas Creosoting Company—512 Main Street, Orange, Texas—Creosoted Southern Yellow Pine and Douglas Fir Poles. Can also treat with "Penta."

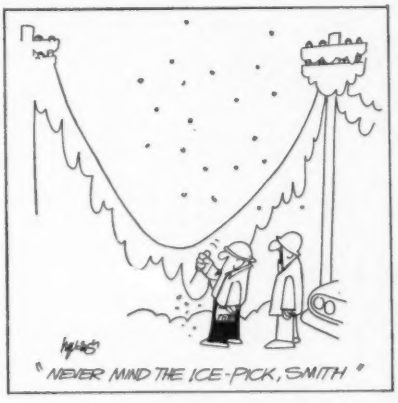
he was associated with Remler Co., Ltd., San Francisco, and prior to that was with Bill Jack Scientific Instrument Co. of Solano Beach, Cal.

Mr. Garzoli is a member of the Institute of Radio Engineers and author of a published paper, "A Four Channel Power Line Carrier System."

Mr. Campbell also announced that Gus J. Smyrnos has joined the engineering staff of Lynch Communication Systems Inc.

Mr. Smyrnos was with the General Electric Co., Lynchburg, Va., for three years before joining Lynch and before that he worked at Lenkurt Electric Co.

He received his BSEE from the University of California at Berkeley. Mr. Smyrnos is a member of the Institute of Radio Engineers.



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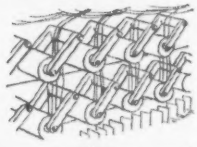

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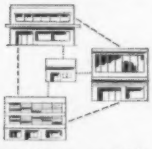

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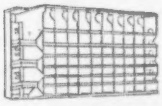

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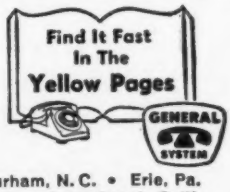

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